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BY EXECUTIVE ORDER REVIEW TEAM
DATE: 22 Mar 2000 **REVIEWER:** 61

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RETURN TO
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ASI/HOA
Maxwell AFB, AL 36112

30 JUN 1989

DEPLOYMENT HISTORY OF [illegible]

HISTORY OFFICE
CHIEF OF STAFF
SPACE AND MISSILE SYSTEMS ORGANIZATION
AIR FORCE SYSTEMS COMMAND

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BY EXECUTIVE ORDER REVIEW TEAM
DATE: 22Mar2000 REVIEWER: 61

Director
Aerospace Studies
ATTN: Archives
Maxwell AFB, Ala.

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DOCUMENT HISTORY OF PROGRAM 461

30 JUN 1989

Prepared by

S. A. Grassly

November 1971

HISTORY OFFICE
CHIEF OF STAFF
SPACE AND MISSILE SYSTEMS ORGANIZATION

[redacted] 30 JUN 1989

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DOCUMENTARY HISTORY OF PROGRAM 461

Prepared under the provisions of Air Force Regulation 210-3 and Air Force Systems Command Supplement No. 1 thereto as part of the United States Air Force Historical Program.

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DOCUMENTS [illegible]

1. Msg, WDTR 2-36-E, 3 Mar 58.
2. Msg (C/Gp3), 05-12-02 Comdr ARDC to Comdr AFBMD, 121910Z May 58.
3. Memo (C/Gp3), WDTSR for Colonels Terhune and Curtin, subj: Subsystem G, WS 117L, 16 Jun 58.
4. Msg (C/Gp3), OSD 944956 to Comdr AFBMD, 1720[illegible]Z Jul 58.
5. Msg (C/Gp3), WDZW 10-9-1 to Comdr ARDC, 10 Oct 58.
6. Msg (C/Gp3), RDZGW-10-40-E for WDGE, Col Hamilton; WDE, Col Curtin; WDZW, Col Evans; WDP, Col Hughes; WDC, Col Summers, 232050Z Oct 58.
7. ARPA Order No. 38-59 (C/Gp3), 5 Nov 58, w/Atch 1, Preparation of Reports.
8. Msg (C/Gp3), RDZCW-11-10-E, 1021[illegible]Z Nov 58.
9. Memo, WDE for Gen Ritland, subj: Program Management for Subsystem G, 20 Nov 58 w/1 Incl: Memo for Col Hughes, same subj.
10. Ltr (C/Gp3), WDZW to Director, ARPA, subj: Review of ICBM Infrared Warning from Satellites, 7 Jan 59.
11. Ltr (C/Gp3), WDZW to Comdr ADC, subj: 117L Subsystem "G," 16 Jan 59.
12. Msg (C/Gp3), DEF 954458 from OSD ARPA to Comdr AFBMD, 041954Z Feb 59.
13. Memo (C/Gp3), AF Under Secretary Malcolm A. MacIntyre for Secretary of Defense, 12 Feb 59.
14. Msg (C/Gp3), WDZW 2-2-E for AFDAS, 13 Feb 59.
15. Msg, AFDDP-B 35968 ([illegible]), 17 Feb 59.
16. Memo (C/Gp3), AFDAS for the Under Secretary of the Air Force, subj: (U) Midas, 20 Feb 59.
17. ARPA Order No. 38-59, Amend No. 1 (S/Gp3), 2 Mar 59.
18. Msg (C/Gp3) OSD DEF 955903 to Comdr AFBMD, 062127Z Mar 59.
19. Msg (C/Gp3), WDZW-3-9-E to SAF, Info: CofS Hq USAF and Comdr ARDC, 9 Mar 59.

20. Msg (C/Gp3), AFCGM-A 57339, 091843Z Mar 59.

21. Msg (C/Gp3), RDZYA 19-3-4-E, 191816Z Mar 59.

22. Msg (C/Gp3), DEF 956704, 202243Z Mar 59.

23. ARPA Order No. 38-59 Amend No. 2 (C/Gp3), 1 Apr 59, w/1 Atch: Preparation of Reports.

24. ARPA Order No. 38-59 Amend No. 3 (C/Gp3), 16 Apr 59.

25. Msg (C/Gp3), WDZW 5-4-E, 6 May 59.

26. Memo for the Assistant Secretary of Defense (Comptroller) from Roy W. Johnson, Director ARPA, undated.

27. Monthly Progress Report for the MIDASProgram (C/Gp3), 8 May 59.

28. Msg (C/Gp3), AFDAT 51036, 182059Z May 59.

29. Memo for Mr. W. J. McNeil, Asst Secretary of Defense (Comptroller) from Executive Office of the President, Bureau of the Budget, 18 May 59.

30. Msg (C/Gp3), RDZG-19-5-1-E, 192000Z May 59.

31. ARPA Order No. 38-59 Amend No. 4, 20 May 59.

32. Msg, DEF 411493, 201831Z May 59.

33. Memo for Comdr ARDC from Roy W. Johnson, Director, ARPA, subj: Fund Allocation for MIDAS, 20 May 59.

34. Memo for the Director, ARPA from Herbert F. York, subj: FY 1959, Emergency Fund Allocation for MIDAS, 27 May 59.

35. Msg (C/Gp3), WDZC 5-5-E, 29 May 59.

36. Msg, RDZB-1-6-1-E, subj: Weapon System 117L "Sub-System G," 011613Z Jun 59.

37. Monghly Program Progress Report for the MIDAS Program, (C/Gp3), 8 Jun 59.

38. Msg (C/Gp3), WDZWM 6-2-E, 8 Jun 59.

39. Msg (C/Gp3), WDZWM 6-4-E, 8 Jun 59.

40. Ltr (S/Gp3), WDZ to Hq USAF ([illegible]), subj: Transmittal of Revised Pages to ARPA Order 38-59, MIDAS Development Plan, 10 Jun 59.

41. Msg (C/Gp3), WDZ-6-8-E, 11 Jun 59.

42. Msg (C/Gp3), Comdr Pacific Missile Range to Comdr AFBMD, 170030Z Jun 59.

43. ARPA Order No. 38-60, Amend No. 5, 1 Jul 59.

44. Ltr (S.Gp3) from Brig Gen O. J. Ritland, Comdr AFBMD to ARDC (LtGen B. A. Schriever, 10 Jul 59.

45. ARPA Order No. 38-60, Amend No. 6, 30 Jul 59.

46. Midas Program Progress Report, 31 July 1959 (C/Gp3), 7 Aug 59.

47. Msg (C/Gp3), DEF 963871, 142119Z Aug 59.

48. Ltr (S/Gp3), WDZ to ARDC (LtGen Schriever), subj: Midas-Personal Letter to Dr. York, 21 Aug 59, w/1 Atch: Draft letter to Dr. York w/o atch.

49. ARPA Order No. 38-60, Amend No. 7 (S/Gp3), 26 Aug 59.

50. Ltr (C/Gp3), WDZSM to various offices, subj: Reorientation of the MIDAS Program, 2 Sep 59, w/1 Atch: Program Schedule as of 26 Jul 59.

51. MIDAS Program Progress Report, 31 Aug 59 (C/Gp3), 8 Sep 59.

52. Ltr (C/Gp3), LtGen B. A. Schriever to General Thomas D. White, CofS, USAF, no subj, 15 Sep 59, w/o atchs.

53. Msg (S/Gp3), WDZSM-10-1-E, 1 Oct 59.

54. ARPA Order No. 38-60, Amend No. 8, 8 Oct 50.

55. ARPA Order No. 38-60, Amend No. 9, 20 Oct 59.

56. Msg, DEF 443636, 211445Z Oct 59.

57. MIDAS Program Progress Report, 9 Nov 59.

58. ARDC Form 111, Management Report, Advanced Reconnaissance System, 13 Nov 59.

59. Msg, RDZGW-11-18-E, 131847Z Nov 59.

60. Memorandum for Secretary of Air Force (C/Gp3) from Secretary of Defense, subj: Transfer of MIDAS Program to the Department of the Air Force, 17 Nov 59.

61. ARPA Order No. 38-60, Amend No. 10, 3 Dec 59.

62. Msg (S/Gp3), from CINCSAF to ARDC, info AFBMD, DPL 5919, subj: SAMOS and MIDAS Programs, 302300Z Dec 59.

63. Msg (C/Gp3), WDZYM-1-11-E, 16 Jan 60.

64. Msg (C/Gp3), AFDAT 64965, 221948Z Jan 60.

65. Midas I Fact Sheet, 26 Feb 60.

66. Ltr, WDZYM to LBZJ, subj: MIDAS Launches between April 1960 and December 1960, 31 Mar 60.

67. Ltr, LBZSP to Douglas Aircraft Company, Inc., subj: Budget Estimate for Preliminary Engineering and Planning Effort for MIDAS Launches, 1 Apr 60.

68. MFR, WDGE, Col Ray E. Soper, subj: AFBMC Review of the MIDAS Program, 23 Jun 60.

69. Msg (S/Gp3), AFDSD-MS 80479, 23 Feb 61.

70. British Parliament Statement, 19 Jul 61.

71. SOR No. 209 (S/SAR/Gp4) subj: Short Title SORTAMDAS, 28 Jan 64.

72. DD No. 46 (C/Gp4), Subj: Development Directive for Program 461, 5 May 65.

73. Msg (S/Gp1), MSFU 14325, 17 Feb 65, contained on page 13-1, PTDPP 266, 15 Nov 65, and pages 13-2, 13-3/4, subj: Authorizations.

74. List of Launches (S/Gp3), pages 6-5 to 6-9, Proposed System Package Plan (PSPP) for Program 949, 15 Apr 67.

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X AF NOIRE-X 012 SECRET

COMDR, AFBMD, INGLEWOOD, CALIFORNIA

CINCNORAD
ENT AIR FORCE BASE, COLORADO

INFO: COMDR
ARDC
ANDREWS AIR FORCE BASE, MARYLAND

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SECRET FROM WDTR 2-36-E FOR NOIRE-X INFO FOR RDZGW - Lt Col Worthman REFERENCE YOUR REQUEST FOR BRIEFING ON WS 117L WITH PARTICULAR EMPHASIS ON THE APPROACH OF INFRARED SENSORS CMA THIS HEADQUARTERS IS PRESENTLY INVESTIGATING THE USE OF INFRARED TECHNIQUES WITH 117L CONTRACTORS ON A COMPREHENSIVE SCALE PD AT THIS TIME THERE HAVE NOT YET BEEN ANY SIGNIFICANT RESULTS FORTHCOMING AND WE WOULD PREFER THIS BRIEFING TO YOU BE DEFERRED UNTIL SUCH TIME AS A REALISTIC INFRARED PROGRAM CAN BE IDENTIFIED.

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DOD DIR 5200.10

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March 1958

WDTR

Colonel F. C. E. Oder
2751

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SIGNED

O. J. RITLAND
Brig. Gen., USAF
Vice Commander

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WDTR 58-114

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TO COMDR AFBMD INGLEWOOD CALIF/COL ODER WDTSR AND MAJ MARE WDTR/
BT
/C O N F I D E N T I A L/CITE TWX 05-12-02.
SUBJECT IS SUBSYSTEM G WS 117L. REFERENCE TELECON COL LENFEST AND COL HAMILTON ON 9 MAY. PART I. HQ ARDC IS REEVALUATING THE TOTAL AICBM PROGRAM IN PREPARATION FOR AN AIR FORCE PRESENTATION TO DOD. ARDC EVALUATION DUE FOR PRESENTATION AT HQ USAF END OF THIS WEEK. OUR GENERAL EVALUATION CONSISTS OF REANALYSIS OF THE EFFORTS UNDERWAY IN DECEMBER 57 WHEN THE SECRETARY OF DEFENSE DIRECTED AIR FORCE TERMINATION OF ALL AICBM EFFORT BUT [illegible]. THIS EXERCISE IS DIRECTED BY DOD IN ORDER TO REESTABLISH THE DOD DECISION CONCERNING AICBM. ARDC POSITION IS GENERALLY THE

PAGE TWO RJEPFF
SAME AS POSITION IN DECEMBER SINCE I.E., ENVIRONMENTAL AND CONTROL ARE THE MAJOR PROBLEMS TO BE SOLVED. THE ARDC POSITION BREAKS DOWN INTO FOUR MAJOR CATEGORIES, ELECTRONICS, GEOPHYSICS, WEAPON EFFECTS AND MISSILES. THE FIRST THREE DOMINATE THE SYSTEM. PRESENTATION WILL SAY LITTLE ABOUT THE MISSILE AT THIS TIME UNTIL THE STATE OF THE ART IS MORE FULLY UNDERSTOOD. PART II. REQUEST YOUR COMMENTS CONCERNING SUB-SYSTEM G WS-117L AND ITS APPLICATION TO THE AICBM ENVIRONMENT. IT APPEARS HERE THAT PRESENTATION ON AICBM SHOULD INCLUDE SUBSYSTEM G 117L AND RECOMMEND STRONG SUPPORT FOR ADDITIONAL EFFORT ON THIS PROJECT. REQUEST YOUR COMMENTS AND DEPENDING UPON YOUR DESIRES, WOULD WELCOME YOUR REPRESENTATIVE HERE THIS WEEK TO HELP PREPARE ARDC POSITION IN THIS REGARD.
BT
12/1915Z MAY RJEPFF

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MEMORANDUM FOR COLONEL TERHUNE
COLONEL ~~CURTIN~~

JUN 16 1958

SUBJECT: Subsystem G, WS 117L

1. Since the first of the year, our WS 117L office has been pressuring Lockheed Missile Systems Division for a realistic evaluation of the ICBM infrared detection system (Subsystem G), and their recommendations for a technically sound and consistent development program for this payload. After considerable vacillation and indecision, it appears that LMSD now has their house in order and is ready to make recommendations on the future of Subsystem G. The meeting with top management personnel of LMSD has been scheduled for 0930 Friday, 20 June at this Division and will, in addition to a presentation on the technical aspects of this subsystem, include recommended program schedules and budgetary cost estimates.

2. Beginning with the presentations of 20 June, the WS 117L office proposes to initiate a BMD in-house evaluation of this subsystem and subsequently, depending on the stature of the LMSD recommendations, to have a technical appraisal of the program by a small select group of leading infrared-knowledgeable scientific types from RAND, Lincoln Laboratories, ATIC, and members of appropriate air defense committees. From such effort it is believed that a well oriented consensus of the capabilities and feasibility of this system should evolve from which a BMD position and recommendations to DOD agencies can be made.

3. Lockheed has indicated their desire for BMD staff representation at the 20 June presentation after which a repeat performance is planned for Generals Schriever and Ritland.

HARRY L. EVANS
Colonel, USAF
Assistant Deputy Commander
Space Systems

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TO COMAF BMD ARDC INGLEWOOD
BT

/S E C R E T/944956 FM ARPA OSD SIGNED ROY W JOHNSON
REQUEST BMD ARRANGE DETAILED TECHNICAL BRIEFING ON WS 117L FOR MEMBERS OF ARPA STAFF CMM WITH SPECIAL REFERENCE TO APPLICABILITY OF SUBSYSTEMS AND COMPONENTS TO OTHER USES SUCH AS COMMUNICATIONS CMM WEATHER AND SCIENTIFIC MEASUREMENTS. ALSO UTILITY OF GROUND COMPLEX FOR GENERAL SATELLITE TRACKING. IN ADDITION CMM ARPA DESIRES DISCUSSION OF ADVANCED COMPONENT REQUIREMENTS FOR LATER RECONNAISANCE SATELLITES SUCH AS IMPROVED ENGINES CMM TELEVISION-TYPE SENSING AND DATA STORAGE CMM INFRARED DETECTION AND TRACKING CMM ADVANCED POWER SUPPLIES CMM ETC. PURPOSE OF DISCUSSION IS TO PERMIT

PAGE TWO RJWZNF 19F
ARPA PERSONNEL TO EFFECT BETTER COORDINATION BETWEEN WS 117L AND OTHER PROGRAMS NOW BEING PLANNED WITH THE OBJECTIVE OF GREATER COMMON USAGE OF EQUIPMENT. SUGGEST 2-DAY SESSION 14 AND 15 AUGUST IF CONVENIENT
BT
20/1653Z RJWZNF THIS IS AN AC MESSAGE

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COMMANDER, AFBMD, INGLEWOOD, CALIFORNIA

COMMANDER
AIR RESEARCH DEVELOPMENT COMMAND
ANDREWS AIR FORCE BASE
MARYLAND

COFS
HEADQUARTERS, USAF, WASHINGTON 25, D.C.

SECRET FROM WDGN 10-9-E [illegible] HEADQUARTERS, USAF. REFERENCE AFBMD MESSAGE WDGN-10-5-E, 6 OCTOBER 1958, TO HEADQUARTERS, USAF, INFORMATION COPY TO HEADQUARTERS, ARDC, CONCERNING SUBSYSTEM "G" SUPPLEMENT TO ADVANCED RECONNAISSANCE SYSTEM DEVELOPMENT PLAN, 17 SEPTEMBER 1958. PART II OF THE CITED MESSAGE DESCRIBES PRELIMINARY ACTIONS UNDERWAY TO CARRY OUT THE SUPPLEMENTAL DEVELOPMENT PLAN AND STATES THAT FUNDS ARE NOT AVAILABLE TO COVER ANY SUBSYSTEM "G" COSTS WITHIN THE FY 59 ARPA CEILING ON WS 117L. THE PURPOSE OF THIS MESSAGE IS TO REQUEST RELEASE OF ADDITIONAL FUNDS TO COVER THE EFFORT REQUIRED ON SUBSYSTEM "G" THROUGH 15 DECEMBER 1958. YOU WILL RECALL THAT IT HAS BEEN PROPOSED THAT AFMTC ATLAS 117L PROGRAM BE DELETED FROM THE BASIC WS 117L PLAN IN ORDER TO KEEP WITHIN THE FY 59 ARPA

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October 1958

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s/ Col Evans

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COMMANDER, AFBMD, INGLEWOOD, CALIFORNIA

CEILING; ALL AFMTC OPERATIONS AND RELATED VEHICLE FABRICATION MUST BE TERMINATED PROMPTLY IF THESE FY 59 SAVINGS TO THE BASIC PROGRAM ARE TO BE REALIZED. HOWEVER, THE ATLAS/117L FLIGHTS FROM AFMTC ARE NEEDED FOR SUBSYSTEM "G". A SHUTDOWN OF THE LOCKHEED WS 117L FACILITY AT AFMTC WOULD BE UNDESIRABLE AND WOULD ENTAIL LAY-OFFS OF PERSONNEL AND SUBSEQUENT DELAYS IN RE-HIRING AND REORGANIZING. A CONSIDERABLE SAVING IN TIME AND MONEY CAN BE ACHIEVED BY CONTINUING THE AFMTC OPERATION AND VEHICLE FABRICATION WITHOUT INTERRUPTION BY USING SUBSYSTEM "G" FUNDS. IN ADDITION, ORDERS SHOULD BE PLACED NOW FOR FABRICATION OF IR PAYLOAD COMPONENTS. THEREFORE THE IMMEDIATE FUND REQUIREMENTS FOR SUBSYSTEM "G" FOR THE PERIOD 15 OCTOBER 1958 TO 15 DECEMBER 1958 ARE: (1) PAYLOAD (SENSOR) FABRICATION $450,000, (2) SATELLITE VEHICLE AND GSE FABRICATION $1,000,000, (3) CONTINUATION OF AFMTC LAUNCH SITE MODIFICATIONS $405,000. THE TOTAL SUBSYSTEM "G" FUNDING REQUIRED THROUGH 15 DECEMBER 1958 IS $1,855,000. THIS WILL OCCASION THE LEAST DELAY SHOULD A SUBSEQUENT DECISION BE MADE TO PROCEED WITH TOTAL SUBSYSTEM "G" PROGRAM. WE RECOMMEND THAT THE ABOVE FUNDS BE PROVIDED. IT IS POSSIBLE TO REDUCE THE ADDITIONAL FUNDS REQUIRED FOR THE PERIOD 15 OCTOBER 1958 TO 15 DECEMBER 1958 BY POSTPONING ANY FURTHER ACTIVITY IN FABRICATION OF SATELLITE VEHICLES AND GSE FOR AFMTC. SUCH ACTION IS POSSIBLE IF ONE IS PREPARED TO SUFFER THE DELAY IN FIRST FIRING WHICH WOULD THEN ENSUE. THE REDUCED FUND REQUIREMENT WOULD THEN BE $855,000. SHOULD EITHER CHOICE FOR ADDITIONAL FUNDING BE ACCEPTED, SUCH NOTICE OF AUTHORITY TO PROCEED WILL BE REQUIRED BY THIS OFFICE

WDZW-58-547

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COMMANDER, AFBMD, INGLEWOOD, CALIFORNIA

NO LATER THAN 17 OCTOBER 1958 OR THE EFFORT ON SUBSYSTEM "Q" WILL BE REDUCED TO $ 0 ON THAT DATE. ~~[illegible]~~

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FM COMARDC ANDREWS AFB MD
TO COMAFBMD ARDC INGLEWOOD CALIF
BT
/CONFIDENTIAL/ FROM RDZGW-10-40-E. FOR WDGE, COL HAMILTON SMCLN WDZ, COL CURTIN SMCLN WDZW, COL EVANS SMCLN WDP, COL HUGHES SMCLN WDC, COL SUMMERS. FOLLOWING TWX MESSAGE FROM HQ USAF, AFDRD. IS QUOTED FOR YOUR INFORMATION CLN QUOTE CONFIDENTIAL FROM AFDRD 59958. REFERENCE CONVERSATION BETWEEN GENERAL SWOFFORD AND COLONEL KIESLING IT IS DIRECTED THAT PRESENT ADVANCED INFRA RED TECHNOLOGY DEVELOPMENT NOW BEING PERFORMED BY B M D BE CONTINUED. APPROPRIATE FUNDING ACTION WILL BE ACCOMPLISHED IN NEAR FUTURE. UNQUOTE
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see amendments
#1, 2 mar 1959
#2, 1 apr 1959
#3, 16 apr 1459
#4, 20 may 1959
#5, 1 Jul 1959
#6, 30 Jul 1959

ARPA Order No. 38-59

November 5, 1958 Date

#7, 26 aug 1959
#8, 8 oct 1959
#9, 20 oct 1959
#10, 3 Dec 1959

TO: Commander
Air Research and Development Command
Andrews Air Force Base
Washington 25, D. C.

1. Pursuant to the provisions of DoD Directive 5105.15, dated February 7, 1958, you are requested to proceed at once on behalf of the Advanced Research Projects Agency with the project specified below. Additional details and directives may be issued by ARPA from time to time and will become a part of this Order when so specified.

2. Study and development begun as Subsystem G of Weapon System 117L are to be continued, in accordance with this outline, as an independent project, to result in an orbitally flight tested Missile Defense Alarm Satellite (MIDAS) (U). Tasks to be carried out are.

a. Prepare for approval by ARPA a definitive statement of work remaining to be done and costs to be incurred on development, ground testing, and limited orbital flight testing of a Missile Defense Alarm Satellite, including necessary communication capability, and including studies aimed at defining a development program for a more advanced capability for missile defense alarm. The project definitively stated should be completed by April 30, 1960, and the work statement should indicate intended dates of reaching important milestones, against which progress of the projects can be monitored, and estimates for work to be performed (1) by ARDC, (2) by contract, and (3) at other Government facilities. The statement of the program to be prepared should be submitted to ARPA by December 15, 1958.

b. Continue fabrication of two completely functioning infrared-sensing satellite payloads. Plan completion in fully functioning form of an additional payload, initially only a thermal simulacrum.

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c. Initiate study and development of satellite/ground communication equipment specifically needed for initial flight tests.

d. Initiate design effort necessary properly to integrate payload and THOR-boosted SENTRY vehicle on an experimental basis, and to insure availability of auxiliary power adequate to permit significant data accumulation during test flights.

e. Plan early orbital flight experiments, to use the basic satellite vehicle of the SENTRY program, boosted by THOR missiles. These experiments should evaluate satellite stabilization and communications, as well as infrared payload and signals.

f. Initiate preliminary design study of infrared trackers and precise direction readout devices, leading toward an integrated missile-defense alarm payload of more advanced capabilities.

g. Plan further orbital experiments, to use vehicles and payloads more advanced than those of the initial flight tests.

h. Examine the possibility of designing simple experiments and building simple payloads to make use of possible excess load capacity on missile or satellite flights of other programs, for obtaining additional data of value to the MIDAS project.

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i. Continue, for the present, experimental program to secure physical data on infrared phenomena, as needed for effective engineering development of the alarm satellite. Process results of these experiments, and of other measurement programs, to contribute most effectively to the MIDAS project.

3. This Order makes available $750,000 under appropriation and account symbol "97X0113.002 Salaries and Expenses, Advanced Research Projects Agency, Office of the Secretary of Defense" for obligation by the Air Research and Development Command on behalf of the Advanced Research Projects Agency only for purposes necessary to accomplish the work specified herein. These funds are for the period November 1, 1958, to January 31, 1959, and immedia[illegible]

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available for direct obligation and for use in reimbursing the Air Research and Development Command for costs incurred under this Order. The funds made available are not for the construction of facilities.

4. The costs chargeable to this project (formerly Subsystem G) since July 1, 1958, and charged to ARPA Order No. 9, shall be identified and transferred to this Order. Funds shall be adjusted by ARPA as appropriate.

5. The Director, Advanced Research Projects Agency, will provide policy and technical guidance either directly or through designated representatives. The Air Research and Development Command will be responsible for arranging for the detailed technical directions necessary to accomplish the specified objectives and to comply with ARPA policy and technical guidance. This general relationship may be specified in greater detail by amendment to this Order if such action is necessary.

superseded - see Amendment #2, 1 Apr 1959

6. The Director, Advanced Research Projects Agency, will be kept informed of the status of work assigned under this Order by a monthly progress report and a semi-annual technical report to be prepared and submitted in accordance with procedures outlined in Attachment No. 1. These reports represent ARPA's total foreseeable requirement for recurring reports based on this Order.

7. The utilization of equipment and materials procured in connection with this project for other projects is subject to the direction of ARPA. Notwithstanding, final disposition of such equipment and materials shall be made in accordance with standard procedures. Any technical and scientific information relating to work under this Order which may be published from time to time shall give appropriate credit to the ARPA project. No scientific and technical progress and status reports on ARPA's projects or final completion reports prepared specifically at ARPA's request shall be made available to other agencies or individuals without approval of ARPA.

8. ARDC shall be responsible for preserving the security of this project in accordance with the security classification assigned and the security regulations and procedures of the Department of the Air Force.

~~CONFIDENTIAL~~

[redacted]

9. Notwithstanding any other provisions of this Order, ARDC shall not be bound to take any action in connection with the performance of this work that would cause the amount for which the Government will be obligated hereunder to exceed the funds made available, and the obligations to ARDC to proceed with the performance of this work shall be limited accordingly. ARDC shall be responsible for assuring that all commitments, obligations and expenditures of the funds made available are made in accordance with the statutes and regulations governing such matters, provided that whenever such regulations require approval of higher authority such approvals will be obtained from or through the Director, ARPA, or his designated representative.

Roy W Johnson

Roy W. Johnson
Director

Attachment:
No. 1

cc: Secretary of the Air Force

~~CONFIDENTIAL~~

ARPA Order No. ~~[illegible]~~

Attachment No. 1

PREPARATION OF REPORTS

A/R [illegible] 1 apr 59

I. Monthly Progress Report.

This report will be submitted in two parts, a Narrative Section and a Milestone Progress Section.

Narrative Section. A letter report will be prepared each month by the addressee of the above numbered ARPA Order, giving a narrative account of work performed under the Order. The initial report will cover the first calendar month following the date of this Order. Subsequent reports will cover work performed during each month thereafter. The report will be submitted in quadruplicate to the Director, Advanced Research Projects Agency, and is due within 10 days following the close of the month reported. The ARPA Order number and subject of the project should be stated in the heading of each report.

The report will be in letter form and generally not exceed three pages in length. It will present a narrative summary of work performed, including technical status, major accomplishments, problems encountered, future plans, and any action required by ARPA. The initial report should include an introductory preface outlining the background, objectives, and assignment of responsibility for the project. All reports should include photographs and illustrations as appropriate. In addition, an autopositive negative (kodalith master) for each illustration should be included, where practical, for use in presentations or reproductions.

Milestone Progress Section. Instructions for preparation of this section, which requires use of a standard format in reporting actual progress against planned progress in accomplishing major milestones, will be issued at a later date.

II. Semi-Annual Technical Summary Report.

A technical summary report will be prepared semi-annually for periods ending June 30 and December 31 of each year. The report will present a concise and factual discussion of technical findings and accomplishments during the quarter. The initial technical summary report will cover a period of at least 3 months subsequent to issuance of a contract or work order; otherwise, the report should be delayed until close of the next 6-month period. The report will be submitted in quadruplicate to the Director, Advanced Research Projects Agency, and is due within 30 days following the close of the report period. Additional distribution may be specified by ARPA [illegible] future date. The ARPA Order number and subject of the project shou[illegible] stated in the heading of each report.

12

WD-58-08238 Arpa Order

[redacted] ~~CONFIDENTIAL~~ C1005

8

Date 10 Nov 58 WDZ
Recd 11 Nov 58

WDZW
WDGR Date 10 Nov 5
WDG
WDGV — OPR

PP RJWZBK
DE RJEZFF 20C
P 102140Z
FM COMDR ARDC ANDREWS AFB MD
TO COMDR AFBMD ARDC INGLEWOOD CALIF
BT
/S E C R E T/FROM RDZGW-11-10-E. FOR WDZ, COL CURTIN. INFO WDGE, COL HAMILTON, WDZW, COL EVANS. THIS MESSAGE IN 2 PARTS. PART 1 FOR MR. FERGESON - PLEASE CALL COLONELS CURTIN AND HAMILTON AND ADVISE THEM THAT THIS MESSAGE IS ARRIVING. PART 2 FOR COL CURTIN. WE HAVE RECEIVED ARPA ORDER 38-59 TODAY AND ARE QUOTING IT FOR YOUR ACTION. COPIES OF THIS ORDER ARE ALSO BEING SENT TO YOU BY SPECIAL MAIL POUCH. GENERALS SESSUMS AND MCNICKLE HAVE SEEN THE ORDER AND HAVE DISCUSSED HOW IT SHOULD BE HANDLED. GENERAL SESSUMS HAS DIRECTED THAT THE ORDER WILL BE HANDLED BY THE AFBMD, AND HAS GIVEN THE SPECIAL INSTRUCTION THAT IT IS TO BE DOCUMENTED UNDER WS 224A. THE

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PAGE TWO RJEZFF 20C
DEVELOPMENT PLAN MUST BE COORDINATED WITH COL GOULD"S OFFICE, RDZE. IN VIEW OF THE RECENT ARRIVAL OF THIS ORDER AND IN VIEW OF GENERAL SESSUMS INSTRUCTIONS, REQUEST YOUR COMMENTS ON THE IMPLICATION OF THESE EVANTS WITH REGARD TO YOUR WDZW 11-4-E. HAVE EVENTS OVERTAKEN YOUR MESSAGE QUES. IF NOT, PLEASE ADVISE SOONEST. ARPA ORDER 38-59 READS AS FOLLOWS CLN "ARPA ORDER NO. 38-59 DATED NOVEMBER 5, 1958. TO CLN COMDR ARDC ANDREWS AFB WASH 25 DC.

14

1. PURSUANT TO THE PROVISIONS OF DOD DIRECTIVE 5105.15, DATED FEBRUARY 7, 1958, YOU ARE REQUESTED TO PROCEED AT ONCE ON BEHALF OF THE ADVANCED RESEARCH PROJECTS AGENCY WITH THE PROJECT SPECIFIED BELOW. ADDITIONAL DETAILS AND DIRECTIVES MAY BE ISSUED BY ARPA FROM TIME TO TIME AND WILL BECOME A PART OF THIS ORDER WHEN SO SPECIFIED.

2. STUDY AND DEVELOPMENT BEGUN AS SUBSYSTEM G OF WEAPON SYSTEM 117L ARE TO BE CONTINUED, IN ACCORDANCE WITH THIS OUTLINE, AS AN INDEPENDENT PROJECT, TO RESULT IN AN ORBITALLY FLIGHT TESTED MISSILE DEFENSE ALARM SATELLITE /MIDAS/ /U/. TASKS TO BE CARRIED OUT ARE CLN

A. PREPARE FOR APPROVAL BY ARPA A DEFINITIVE STATEMENT OF WORK REMAINING TO BE DONE AND COSTS TO BE INCURRED ON DEVELOPMENT, GROUND TESTING, AND LIMITED ORBITAL FLIGHT TESTING OF A MISSILE DEFENSE ALARM SATELLITE, INCLUDING NECESSARY COMMUNICATION CAPABILITY, AND INCLUDING

[redacted] ~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

PAGE THREE RJEZFF 20C
STUDIES AIMED AT DEFINING A DEVELOPMENT PROGRAM FOR A MORE ADVANCED CAPABILITY FOR MISSILE DEFENSE ALARM. THE PROJECT DEFINITIVELY STATED SHOULD BE COMPLETED BY APRIL 30, 1960, AND THE WORK STATEMENT SHOULD INDICATE INTENDED DATES OF REACHING IMPORTANT MILESTONES, AGAINST WHICH PROGRESS OF THE PROJECTS CAN BE MONITORED, AND ESTIMATES FOR WORK TO BE PERFORMED /1/ BY ARDC, /2/ BY CONTRACT, AND /3/ AT OTHER GOVERNMENT FACILITIES. THE STATEMENT OF THE PROGRAM TO BE PREPARED SHOULD BE SUBMITTED TO ARPA BY DCEMBER 15, 1958.

B. CONTINUE FABRICATION OF 2 COMPLETELY FUNCTIONING INFRARED-SENSING SATELLITE PAYLOADS. PLAN COMPLETION IN FULLY FUNCTIONING FORM OF AN ADDITIONAL PAYLOAD, INITIALLY ONLY A THERMAL SIMULACRUM.

C. INITIATE STUDY AND DEVELOPMENT OF SATELLITE/GROUND COMMUNICATION EQUIPMENT SPECIFICALLY NEEDED FOR INITIAL FLIGHT TESTS.

D. INITIATE DESIGN EFFORT NECESSARY PROPERLY TO INTEGRATE PAYLOAD AND THOR-BOOSTED SENTRY VEHICLE ON AN EXPERIMENTAL BASIS, AND TO INSURE AVAILABILITY OF AUXILIARY POWER ADEQUATE TO PERMIT SIGNIFICANT DATA ACCUMUL

TION DURING TEST FLIGHTS.

E. PLAN EARLY ORBITAL FLIGHT EXPERIMENTS, TO USE THE BASIC SATELLITE VEHICLE OF THE SENTRY PROGRAM, BOOSTED BY THOR MISSILES. THESE EXPERIMENTS SHOULD EVALUATE SATELLITE STABILIZATION AND COMMUNICATIONS, AS

[redacted]

PAGE FOUR RJEZFF 20C
WELL AS INFRARED PAYLOAD AND SIGNALS.

F. INITIATE PRELIMINARY DESIGN STUDY OF INFRARED TRACKERS AND PRECISE DIRECTION READOUT DEVICES, LEADING TOWARD AN INTEGRATED MISSILE-DEFENSE ALARM PAYLOAD OF MORE ADVANCED CAPABILITIES.

G. PLAN FURTHER ORBITAL EXPERIMENTS, TO USE VEHICLES AND PAYLOADS MORE ADVANCED THAN THOSE OF THE INITIAL FLIGHT TESTS.

H. EXAMINE THE POSSIBILITY OF DESIGNING SIMPLY EXPERIMENTS AND BUILDING SIMPLY PAYLOADS TO MAKE USE OF POSSIBLE EXCESS LOAD CAPACITY ON MISSILE OR SATELLITE FLIGHTS OF OTHER PROGRAMS, FOR OBTAINING ADDITIONAL DATA OF VALUE TO THE MIDAS PROJECT.

I. CONTINUE, FOR THE PRESENT, EXPERIMENTAL PROGRAM TO SECURE PHYSICAL DATA ON INFRARED PHENOMENA, AS NEEDED FOR EFFECTIVE ENGINEERING DEVELOPMENT OF THE ALARM S

TLLITE. PROCESS RESULTS OF THESE EXPERIMENTS, AND OF THER MEASUREMENT PROGRAMS, TO CONTRIBUTE MOST EFFECTIVELY TO THE MIDAS PROJECT.

3. THIS ORDER MAKES AVAILABLE $750,000 UNDER APPROPRIATION AND ACCOUNT SYMBOL "97X0113.002 SALARIES AND EXPENSES, ADVANCED RESEARCH PROJECTS AGENCY, OFFICE OF THE SECRETARY OF DEFENSE" FOR OBLIGATION BY THE AIR RESEARCH AND DEVELOPMENT COMMAND ON BEHALF OF THE ADVANCED RESEARCH PROJECTS AGENCY ONLY FOR PURPOSES NECESSARY TO ACCOMPLISH THE

PAGE FIVE RJEZFF 20C
WORK SPECIFIED HEREIN. THESE FUNDS ARE FOR THE PERIOD 1 NOVEMBER 1958, TO 31 JANUARY 1959, AND IMMEDIATELY AVAILABLE FOR DIRECT OBLIGATION AND FOR USE IN REIMBURSING THE AIR RESEARCH AND DEVELOPMENT COMMAND FOR COSTS INCURRED UNDER THIS ORDER. THE FUNDS MADE AVAILABLE ARE NOT

[redacted] ~~CONFIDENTIAL~~

FOR THE CONSTRUCTION OF FACILITIES. ~~CONFIDENTIAL~~

4. THE COSTS CHARGEABLE TO THIS PROJECT /FORMERLY SUBSYSTEM G/ SINCE 1 JULY 1958, AS CHARGED TO ARPA ORDER NO. SHALL BE IDENTIFIE AND TRANSFERRED TO THIS ORDER. FUNDS SHALL BE ADJUSTED BY ARPA AS APPROPRIATE.

5. THE DIRECTOR, ADVANCED RESEARCH PROJECTS AGENCY, WILL PROVIDE POLICY AND TECHNICAL GUIDANCE EITHER DIRECTLY OR THROUGH DESIGNATED REPRESENTATIVES. THE AIR RESEARCH AND DEVELOPMENT COMMAND WILL BE RESPONSIBLE FOR ARRANGING FOR THE DETAILED TECHNICAL DIRECTIONS NECESSAR TO ACCOMPLISH THE SPECIFIED OBJECTIVES AND TO COMPLY WITH ARPA POLICY AND TECHNICAL GUIDANCE. THIS GENERAL RELATIONSHIP MAY BE SPECIFIED IN GREATER DETAIL BY AMENDMENT TO THIS ORDER IF SUCH ACTION IS NECESSARY.

6. THE DIRECTOR, ADVANCED RESEARCH PROJECTS AGENCY, WILL BE KEPT INFORMED OF THE STATUS OF WORK ASSIGNED UNDER THIS ORDER BY A MONTHLY PROGRESS REPORT AND A SEMI-ANNUAL TECHNICAL REPORT TO BE PREPARED AND SUBMITTED IN ACCORDANCE WITH PROCEDURES OUTLINED IN ATTACHMENT NO. 1.

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PAGE SIX RJEZFF 20C

THESE REPORTS REPRESENT ARPA"S TOTAL FORESEEABLE REQUIREMENT FOR RECURRING REPORTS BASED ON THIS ORDER.

7. THE UTILIZATION OF EQUIPMENT AND MATERIALS PROCURED IN CONNECTION WITH THIS PROJECT FOR OTHER PROJECTS IS SUBJECT TO THE DIRECTION OF ARPA. NOTWITHSTANDING, FINAL DISPOSITION OF SUCH EQUIPMENT AND MATERIA SHALL BE MADE IN ACCORDANCE WITH STANDARD PROCEDURES. ANY TECHNICAL AN SCIENTIFIC INFORMATION RELATING TO WORK UNDER THIS ORDER WHICH MAY BE PUBLISHED FROM TIME TO TIME SHALL GIVE APPROPRIATE CREDIT TO THE ARPA PROJECT. NO SCIENTIFIC AND TECHNICAL PROGRESS AND STATUS REPORTS OF ARPA"S PROJECTS OR FINAL COMPLETION REPORTS PREPARED SPECIFICALLY AT ARPA"S REQUEST SHALL BE MADE AVAILABLE TO OTHER AGENCIES OR INDIVIDUAL WITHOUT APPROVAL OF ARPA.

8. ARDC SHALL BE RESPONSIBLE FOR PRESERVING THE SECURITY OF THIS PROJECT IN ACCORDANCE WITH THE SECURITY CLASSIFICATION ASSIGNED AND THE SECURITY REGULATIONS AND PROCEDURES OF THE DEPARTMENT OF THE AIR FORCE.

9. NOTWITHSTANDING ANY OTHER PROVISIONS OF THIS ORDER, ARDC SHALL NOT BE BOUND TO TAKE ANY ACTION IN CONNECTION WITH THE PERFORMANCE OF THIS WORK THAT WOULD CAUSE THE AMOUNT FOR WHICH THE GOVERNMENT WILL BE OBLIGATED HEREUNDER TO EXCEED THE FUNDS MADE AVAILABLE, AND THE OBLIGATIONS TO ARDC TO PROCEED WITH THE PERFORMANCE OF THIS WORK SHALL BE LIMITED

PAGE SEVEN RJEZFF 20C

ACCORDINGLY. ARDC SHALL BE RESPONSIBLE FOR ASSURING THAT ALL COMMITMENTS, OBLIGATIONS AND EXPENDITURES OF THE FUNDS MADE AVAILABLE ARE MADE IN ACCORDANCE WITH THE STATUTES AND REGULATIONS GOVERNING SUCH MATTERS, PROVIDED THAT WHENEVER SUCH REGULATIONS REQUIRE APPROVAL OF HIGHER AUTHORITY SUCH APPROVALS WILL BE OBTAINED FROM OR THROUGH THE DIRECTOR, ARPA, OR HIS DESIGNATED REPRESENTATIVE. SIGNED - ROY W. JOHNSON, DIRECTOR." CC TO SEC OF THE AF.

BT

10/21A27 NOV RJEZFF

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WDSMCC-58-3171
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AIR FORCE BALLISTIC MISSILE DIVISION
HEADQUARTERS
AIR RESEARCH AND DEVELOPMENT COMMAND
UNITED STATES AIR FORCE
Post Office Box 262
Inglewood, California

In reply address both communication and envelope to Comdr, AFBMD, attention following office symbol

WDZ

NOV 20 1958

MEMORANDUM FOR GENERAL RITLAND

SUBJECT: Program Management for Subsystem G

1. Since it appears relatively certain that Subsystem G will be handled as a part of WS-224A, it appears to me that some special effort is required in order that our program not become tangled.

2. Therefore, I recommend that you sign the attached memorandum.

1 Incl
Memo for Col Hughes
subject as abv

RICHARD D. CURTIN
Colonel, USAF
Deputy Commander
Military Space Systems

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DECLASSIFIED AFTER 12 YEARS.
DOD DIR 5200.10

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~~CONFIDENTIAL~~ 21 NOV 1958

WDZ

MEMORANDUM FOR COLONEL HUGHES

SUBJECT: Program Management for Subsystem G

1. It has been decided that the Infra-red Attack Alarm System will be handled as a portion of WS-224A. Obviously this presents problems of management relative to program documents, program funding, etc.

2. Insure that one of your officers is assigned to make a special effort in conjunction with appropriate individuals of WDZ and of the WS-224A Program Office at Andrews AFB (Col Bechtel) to the effect that necessary program administrative problems are sought out and solved before they create confusion or trouble.

/s/

O. J. RITLAND
Brig. Gen., USAF
Vice Commander

Cy Furnished:
WDZ

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DOD DIR 5200.10

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AIR FORCE BALLISTIC MISSILE DIVISION
HEADQUARTERS
AIR RESEARCH AND DEVELOPMENT COMMAND
UNITED STATES AIR FORCE
Post Office Box 262
Inglewood, California

17 JAN 1959

In reply address both communication and envelope to Comdr, AFBMD, attention following office symbol

WDZW

SUBJECT: Review of ICBM Infrared Warning from Satellites

TO: Director
Advanced Research Projects Agency
Washington, D. C.

1. During discussions with Dr. York on 19 December 1958, a brief summary of data supporting feasibility of WS 117L Infrared Warning System was presented. It was mentioned that this supporting data had been reviewed in detail by a scientific panel for AFBMD in July 1958 and that perhaps a similar review by ARPA and selected members of DOD or Presidential advisory committees would be advantageous. The names of the AFBMD panel are listed in event their comments or further participation is desired.

Dr. Carl F. K. Overhage (Chairman), Project Lincoln
Dr. Stanley S. Ballard, Scripps Institute of Oceanography
Dr. Morris Handelsman, Rome Air Development Center
Dr. Lloyd L. Mundie, Bendix System Division
Dr. Paul J. Ovrebo, Air Technical Intelligence Center
Dr. Sidney Passman, Rand Corporation

2. In view of the express desire of your agency for further evaluation of data supporting the feasibility of WS 117L infrared warning system, it is suggested that AFBMD and its contractors make presentations to the ARPA and suggest selected members of the DOD or Presidential advisory committees as you deem appropriate. This will provide for detailed discussions in each technical area as you may require.

18

O. J. Ritland
O. J. RITLAND
Brig. Gen., USAF
Vice Commander

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RDZGW, ARDC

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16 JAN 1959

WDZW

SUBJECT: 117L Subsystem "G"

TO: Commander
Air Defense Command
ATTN: ADLAN-W
Ent Air Force Base
Colorado Springs, Colorado

1. Reference your letter, subject as above, dated 22 December 1958.

2. We concur with your desire for close cooperation and coordination between our two headquarters in matters pertaining to the Infrared Reconnaissance Program, Subsystem "G". Your appointment of Major John F. Hughes of your Directorate of Plans and Requirements, Deputy for Plans, is noted. Our Project Engineer for the Infrared Program, Major Thomas O. Wear, Directorate WS 117L (WDZWS), will continue to keep in close contact with Major Hughes.

3. Major Hughes' name will be added to the WS 117L Phasing Group as the Air Defense Command representative and he will be invited to all future meetings.

4. Reference paragraph 3 of your letter, it is agreed that the assignment of an ADC Liaison Officer to AFBMD would be premature at this time; however, this office can be established at a later date when project progress will make the function of this office mutually beneficial.

SIGNED

O. J. RITLAND
Brig. Gen., USAF
Vice Commander

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WDZW 59-31
Cy 3 of 6

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NFA003

PP INGL 2382
DE RJWZNF 10F
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FM OSD
TO COMAFBM INGLEWOOD
BT
/S E C R E T/CITE DEF 954458 FROM OSD ARPA SIGD RTY W JOHNSON
PASS TO WDXW PARA REFERENCE YOUR LETTER 7 JAN 1959, CONCERNING ICBM
IR WARNING SKD SCIENTIFIC PANEL IS BEING CONSTITUTED TO REVIEW
ALL TECHNICAL DATA AVAILABLE BEARING UPON THE FEASIBILITY OF
INFARED APPLICATION IN THE EARLY WARNING ROLEREVIEW SCHEDULED
IN PENTAGON 6 FEB. 1959. SEVERAL 1958 AFBMD PANEL MEMBERS WILL
PARTICIPATE. PARA DETERMINATIONS MADE AT THE 6 FEB REVIEW WILL
HAVE MAJOR IMPACT UPON THE MAGNITUDE AND RATE TO BE ESTABLISHED FOR
THE MIDAS PROGRAM. ESSENTIAL THAT PRESENTATION PARTICIPANTS BE
AVAILABLE ON 5 FEB FO R A DRY RUN AND CRITIQUE. DR LUCK HAS
ARRANGED DETAIL WITY MAJOR NEAR YOUR ORGANIZATION, WHO HAS BEEN MOST
HELPFUL IN ASSEMBLING NECESSARY DATA AND ARRANGING FOR
CONTRACTOR PRESENTATIONS FOR THESE MEETINGS
BT
THIS IS "AC"MSG
041956Z JAN RJWZNF

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technical schedules. The Air Force considers this project to be of the highest priority and that, so far as the Air Force is concerned, ARPA's request for Emergency Funds for this project is to be considered a prior claim to any Air Force requests for Emergency Funds.

Signed

Malcolm A. MacIntyre
Under Secretary

Distribution:

Mr. Roy Johnson	Gen Friedman	
Gen Roscoe Wilson	Mr. Horner	SAFS
Gen McCorkle	Mr. Garlock	Ofc of sig
Chief of Staff		AFAEF-10
		OSAF file

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13 FEB 59

PRIORITY

COMDR, AFBMD (ARDC) LOS ANGELES, CALIFORNIA

C OF S
HQ USAF
WASHINGTON, D.C.

INFO: DIRECTOR, ARPA, WASHINGTON, D.C.

SECRET FROM WDZW 2-2-E FOR AFDAT, INFO AFCGM, INFO MR ROY W. JOHNSON AT ARPA. PENDING APPROVAL OF THE MIDAS DEVELOPMENT PLAN, REQUEST 4.75 MILLION BE MADE AVAILABLE TO CONTINUE THE EFFORT FROM 15 FEB TO 15 MAR. THIS AMOUNT IS IN CONSONANCE WITH THE 37.2 MILLIONS REQUESTED FOR FY 59 IN THE MIDAS DEVELOPMENT PLAN DATED 30 JAN 59. UNLESS ADDITIONAL FUNDS ARE PROVIDED, IT WILL BE NECESSARY TO TERMINATE THE EFFORT ON 15 FEB.

Cy furnished:
WDCB, Capt Bagley

WDZW
Captain N. Walecka, X-1812

HARRY L. EVANS
Colonel, USAF
Director of WS 117L

See reply AFDDP-13 35988
17 Feb 59

WDZW 59-150

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COPY

17 FEB 59

FM HQ USAF
TO ZEN/COMARDC
INFO COMDR AFBMD

UNCL FROM AFDDP-B 35988 FOR OFFICIAL USE ONLY

COMARDC PASS TO RDGPP. AFBMD PASS TO WDZW.

REFERENCE AFBMD TWX WDZW-2-2-E, 13 FEBRUARY 1959.

$1.0 MILLION FY 1959 ADMINISTRATIVE RESERVE FUNDS ARE BEING MADE AVAILABLE FOR 621-117L-117L, SUBSYSTEM "G". DIRECTOR OF BUDGET, USAF, WILL ISSUE NECESSARY FUNDING DOCUMENTS.

WDGEH

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON 25, D. C.

~~CONFIDENTIAL~~

16

AFDAT 20 February 1959

MEMORANDUM FOR THE UNDER SECRETARY OF THE AIR FORCE

SUBJECT: (U) Midas

1. The Development Plan for Midas was delivered to ARPA on 12 February 1959 and is being reviewed.

2. The Ad Hoc Committee appointed by Mr. Johnson to review the IR warning from satellites consisted of:

Dr. Carl Overhage, M.I.T.
Dr. E. M. Purcell, Harvard University
Dr. Sidney Passman, Rand Corporation
Dr. Chalmers Sherwin, University of Illinois

In part their recommendations included:

a. Potential use of IR is very promising.

b. There are problems in background discrimination.

c. A test program should be conducted.

3. The financial plan for Midas shows:

Phase I		Phase II	Phase III	Total
FY 59	14.2	11.8	11.224	37.224
FY 60	20.8	38.7	40.394	99.894
				$137.118

a. Phase I consists of 4 launches from Patrick AFB in November 1959, and January, March and May 1960. This is an R&D phase to be funded by ARPA.

b. Phase II consists of 6 launches from Vandenberg AFB in July, September and November 1960, and January, March and May of 1961. This phase is development in nature and the cost will be shared between the Air Force and ARPA.

c. Phase III consists of the operational Defense Alarm System. As such it will be operated by the Air Force. Launches in this phase will begin in July 1961.

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DOWNGRADED AT 12 YEAR INTERVALS; NOT AUTOMATICALLY DECLASSIFIED. DOD DIR 5200.10

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C O P Y

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Memo for SAFUS, subj: (U) Midas

4. The following information on ARPA intentionswas received from Lt Colonel Nadler, USAF, project officer on Midas:

a. Dr. York has appointed a Mr. Bishop to review the Development Plan on Midas and the ARPA request for emergency funds for Midas. Mr. Bishop is to make recommendations to Dr. York. One recommendation is reported to be - allocate $6.0 million of the $15.0 of the Midas portion of the ARPA emergency fund request.

b. ARPA is ready to write an amendment to Order 30-59 to buy Phase I, and will defer blanket approval of Phase II. Funds that will be released by ARPA during the week of 22 February 1959 total $3.75 million. ARPA presently has a total of $11.0 million for Midas. ARPA will then get together with AFBMD to determine a further course of action.

5. The Air Force has been funding Midas at a sustaining rate. To date $5,855 of Air Force funds have been placed on Midas in FY 59. Air Force expects to recoup these funds when adequate ARPA funds are released. Thus, if ARPA releases the total $11.0 million this year, plus the $6.0 of OSD emergency funds reported to be recommended, Phase I of the program can be completed and some of the long lead time items on Phase II can be procured. This, of course, is a continuation of the hand feeding of this program.

6. To meet the scheduled launch dates mentioned in paragraph 3 above, AFBMD must have release of FY 59 funds as follows:

a. Additional funds by 1 March 1959 to sustain the effort.

b. Total Phase I funds by 20 March 1959 to meet flight dates.

c. Estimated $6.8 million of Phase II funds by 20 March 1959 to maintain schedule.

d. Remaining Phase II funds by 15 April 1959.

96

/s/t/ H. A. BOUSHEY
Brigadier General, USAF
Director of Advanced Technology
DCS/Development

Cys furn: WDG, GV, GE
WDP, WDZ

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WASHINGTON 25, D. C.

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MIDAS

ARPA Order No. 38-59
Amendment No. 1

March 2, 1959 Date

TO: Commander
Air Research and Development Command
Andrews Air Force Base
Washington 25, D. C.

1. The program objectives and related funding for the MIDAS program, Phase I only, as presented in development plan dated January 30, 1959, are approved subject, however, to an on-site detailed technical review to be conducted at the earliest practicable date by ARPA personnel. Upon completion of this review, further guidance by amendment to this Order will be forwarded.

2. While Phases II and III of the development plan are not approved at this time, consideration will be given to necessary advanced procurement of ATLAS and SENTRY vehicles for Phase II. You are hereby requested to submit a plan for such procurement as soon as possible.

3. Accordingly, ARPA Order No. 38-59, dated November 5, 1958, is hereby amended to increase the fund availability specified in paragraph 3 thereof from $750,000 to a new total of $8 million under appropriation and account symbol "97X0113.002 Salaries and Expenses, Advanced Research Projects Agency, Department of Defense."

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Roy W. Johnson
Roy W. Johnson
Director

cc: Secretary of the Air Force

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TO COMMANDER AFBMD ARDC INGLEWOOD CALIF
INFO /ROUTINE//ZEN/COMDR ARDC ANDREWS AFB MARYLAND
BT
//S E C R E T// CITE DEF 955900 FROM OSD ARPA SIGNED JOHNSON.
ARPA ORDER NUMBER 38-59 AMENDED MARCH 2 TO PROVIDE CONDITIONAL
APPROVAL OF PHASE I AND FUNDING TO A NEW TOTAL [illegible]

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RPTING LAST LINE

APPROVAL OF PHASE I AND FUNDING TO A NEW TOTAL OF 8 MILLION DOLS.
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[redacted]

3-1-59

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X AF

COMDR, AFBMD (HQARDC) LOS ANGELES, CALIFORNIA

SECRETARY OF THE AIR FORCE
WASHINGTON DC

INFO: COFS, HQ USAF
WASHINGTON DC

COMDR, ARDC
ANDREWS AFB, MARYLAND

SECRET FROM WDZW-3-9-E INFO FOR AFDAT, AFABF AT HQ USAF, RDZGW AT ARDC REFERENCE AMENDMENT NUMBER 1 TO ARPA ORDER 38-59, AN INFO COPY OF WHICH WAS FORWARDED TO AFBMD BY MESSAGE AFCGM-A 57339, 9 MAR 59. PART 2 OF THE AMENDMENT REQUIRES THAT THE AIR FORCE SUBMIT A PLAN FOR ADVANCED PROCUREMENT OF ATLAS AND SENTRY VEHICLES FOR PHASE II OF THE MIDAS DEVELOPMENT PLAN. IN RESPONSE TO THIS DIRECTIVE AFBMD POINTS OUT THAT THE FY 59 FUNDING FOR PHASE II ($11.8 MILLIONS) AS SHOWN IN THE MIDAS DEVELOPMENT PLAN 30 JAN 59 REPRESENTS THE DOLLAR REQUIREMENTS FOR TIME-PHASED PROCUREMENTS TO MAINTAIN THE PHASE II SCHEDULE. SINCE THE DEVELOPMENT PLAN IS BASED ON INCREMENTAL FUNDING, THE SCHEDULES SHOWN THEREIN CANNOT BE MAINTAINED WITH REDUCED FY 59 FUNDS.

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WDZW 59-290
Cy 2 of 5 MAR 59

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Capt Bradburn/dl
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Signed OJR

1 [redacted]

COMDR, AFBMD (HQARDC) LOS ANGELES, CALIFORNIA

WITH RESPECT TO PARAGRAPHS 1 AND 3 OF THE AMENDMENT, WHICH GRANT APPROVAL OF PHASE I ONLY AND MAKE AVAILABLE A TOTAL OF $8 MILLIONS, THE FOLLOWING PROBLEM IS BEING ENCOUNTERED: THE SEPARATE PHASES OF THE MIDAS DEVELOPMENT PLAN ARE NOT INDEPENDENT WITH RESPECT TO FUNDS, NOR WAS THE POSSIBILITY OF PIECEMEAL APPROVAL OF THE PHASES CONSIDERED IN DRAWING UP THE PLAN. THE FUNDS IDENTIFIED TO PHASE I ARE NOT SUFFICIENT UNLESS PHASE II PROCEEDS CONCURRENTLY AS PROVIDED IN THE PLAN. FULL APPROVAL OF THE TOTAL MIDAS FUNDING FOR FY 59 IS THEREFORE RECOMMENDED AS A MATTER OF URGENCY. PENDING FURTHER DIRECTION, AFBMD IS CONTINUING [illegible] ALL EFFORTS NECESSARY TO MAINTAIN THE SCHEDULES FOR ALL PHASES. [illegible] LOCKHEED HAS BEEN INFORMED THAT NO EXPENSES FOR PHASE II LAUNCHES AS SUCH BEYOND $5.85 MILLIONS WILL BE ALLOWED. THIS SUM REPRESENTS AIR FORCE FUNDS RELEASED TO AFBMD TO DATE. THIS LIMIT WILL BE REACHED LATE IN MARCH. AT THAT TIME LOCKHEED WILL BE PERMITTED TO INCUR ONLY THOSE EXPENSES IDENTIFIED TO PHASE II WHICH ARE ESSENTIAL TO THE ACCOMPLISHMENT OF PHASE I. SLIPPAGE OF PHASE II LAUNCH SCHEDULE WILL THEN BEGIN. THUS, A DECISION TO PROCEED WITH THE PRESENT PHASE II SCHEDULE IS OF UTMOST IMPORTANCE AND MUST BE MADE BY 20 MAR 59. IN THE EVENT THAT FULL PROGRAM APPROVAL CANNOT BE OBTAINED FOR ALL PHASES, A NEW FUND PROJECTION BASED ON ACCOMPLISHMENT OF PHASE I ONLY MUST BE PREPARED. FURTHER DIRECTION IS REQUESTED BY 20 MAR 59 TO PRECLUDE SLIPPAGE OF THE PHASE II LAUNCH SCHEDULE.

WDZW 59-290
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TO COMAFBMD INGLEWOOD CALIF
BT
/S E C R E T/AFCGM-A 57339 FOR COL EVANS, WDZW. REFS TELECON
9 MAR WITH COL SINEX. FOL IS AMENDMENT NO. 1 TO ARPA ORDER 38-59:

1. THE PROGRAM OBJECTIVES ANBHGELATED FUNDING FOR THE MIDAS PROGRAM, PHASE I ONLY, AS PRESENTED IN DEVELOPMENT PLAN DATED JANUARY 30, 1959, ARE APPROVED SUBJECT, HOWEVER, TO AN ON-SITE DETAILED TECHNICAL REVIEW TO BE CONDUCTED AT THE EARLIEST PRACTICABLE DATE BY ARPA PERSONNEL. UPON COMPLETION OF THIS REVIEW, FURTHER GUIDANCE BY AMENDMENT TO THIS ORDER WILL BE FORWARDED.

2. WHILE PHASES II AND III OF THE DEVELOPMENT PLAN ARE NOT APPROVED AT THIS TIMEN CONSIDERATION WILL BE GIVEN TO NECESSARY AD-

PAGE TWO RJEZHQ 337
VANCED PROCUREMENT OF ATLAS AND SENTRY VEHICLES FOR PHASE II. YOU ARE HEREBY REQUESTED TO SUBMIT A PLAN FOR SUCH PROCUREMENT AS SOON AS POSSIBLE.

3. ACCORDINGLY, ARPA ORDER NO. 38-59, DATED NOVEMBER 5, 1958, IS HEREBY AMENDED TO INCREASE THE FUND AVAILABILITY SPECIFIED IN PARAGRAPH 3 THEREOF FROM $750,000 TO A NEW TOTAL OF $8 MILLION UNDER APPROPRIATION AND ACCOUNT SYMBOL "97/0113.002 SALARIES AND EXPENSES, ADVANCED RESEARCH PROJECTS AGENCY, DEPARTMENT OF DEFENSE."
BT
09/1848Z MAR RJEZHQ

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1. THE PROGRAM OBJECTIVES AND RELATED FUNDING FOR THE MIDAS

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TO COMDR AFFTC EDWARDS AFB CALIF
INFO COMDR AFBMD ARDC INGLEWOOD CALIF
BT
/S E C R E T/FROM RDZYA: 19-3-4-E: ACTION: AFFTC, ATTN:
MAJOR A. W. THOMPSON, FTO; INFO: AFBMD, ATTN: LT COL RIEPE, WDZW.
SUBJECT IS LOW CARD SUPPORT OF MIDAS.
PART ONE. THE AFFTC IS DIRECTED TO SUPPORT THE MIDAS PROGRAM BEING CONDUCTED BY THE AFBMD. THE LOW CARD PROGRAM WILL SUPPORT MIDAS FROM THE PRESENT DATE UNTIL BUT NOT LATER THAN 30 JUNE 1959 UNLESS OTHERWISE DIRECTED BY THIS HEADQUARTERS. THE SUPPORT WILL INVOLVE THE USE OF AIRCRAFT 722 OR 954 AS DISCUSSED IN CONVERSATIONS BETWEEN COL APPOLD AND MAJOR AKERLAND OF THIS HEADQUARTERS, MAJOR THOMPSON AND MAJOR CARPENTER OF AFFTC AND LT COL RIEPE OF AFBMD.
AFBMD WILL FURNISH TO AFFTC THE OPERATIONAL PLAN OUTLINING THE NECESSARY SUPPORT.
PART TWO. THIS HEADQUARTERS WILL MAKE AVAILABLE TO AFFTC FIFTEEN THOUSAND DOLLARS ($15,000) OF ARPA FUNDS TO COVER THE 02 AND 04 CATEGORIES OF P-490 COSTS. TRAVEL AND COMMUNICATIONS EXPENDITURES WILL BE CHARGED AGAINST ARPA ORDER NUMBER 38-59. AFBMD HAS BEEN CONTACTED AND AGREES TO PROVIDE AFFTC WITH OBLIGATION AUTHORITY FOR UP TO TWENTY THOUSAND DOLLARS ($20,000) TO COVER THE REMAINDER OF THE AFFTC P-590 COSTS FOR THIS OPERATION. AFFTC WILL FURNISH THIS HEADQUARTERS, ATTN: COL APPOLD, RDZ, A BREAKDOWN OF THE COSTS EXPECTED TO BE INCURRED IN THIS SUPPORT.
BT
THIS IS AN "AC" MESSAGE.
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A—PARAPHRASE [illegible] PRIOR
TO CATEGORY B [illegible]
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INFO ZEN/COMARDC ANDREWS AFB
BT
//S E C R E T//DEF 956704 FROM OSD ARPA SGD ROY W. JOHNSON
REFERENCE ARPA ORDER NBR 38-59 AMENDMENT 1, DATED 2 MAR 59 AND MIDAS DEVELOPMENT PLANT SUBMITTED 12 FEB 59. IT IS RE-EMPHASIZED THAT PHASE I ONLY IS APPROVED AT THIS TIME SUBJECT TO VERBALLY DISCUSSED MODIFICATIONS DURING 4 TO 6 MARCH REVIEW AT LMSD. DETAILS OF MODIFICATIONS WILL BE CONFIRMED BY SEPARATE CORRESPONDENCE. RECOGNIZING INTER-RELATION OF PHASE I AND PHASE II FUNDING, ARPA HAS REQUESTED ADDITIONAL FUNDS FROM SECRETARY OF DEFENSE. IT IS ANTICIPATED THAT A MAXIMUM OF $22.79 MILLION TOTAL WILL BE APPROVED FOR FY59, HOWEVER NO POSITIVE ASSURANCE. IN VIEW OF ANTICIPATED APPROVAL. .

"AC—PARAPHRASING NOT REQUIRED EXCEPT PRIOR TO CATEGORY B ENCRYPTION—PHYSICALLY REMOVE ALL INTERNAL REFERENCES BY DATE-TIME GROUP PRIOR TO DECLASSIFICATION—NO UNCLASSIFIED REFERENCE IF DATE-TIME GROUP IS QUOTED."

PAGE TWO RJWZNF 20F
OF FUNDS PLANNING SHOULD BEGIN IMMEDIATELY TO TAILOR THE PROGRAM TO THIS AMOUNT. IT IS RECOGNIZED THAT THIS WILL REQUIRE SOME REDUCTION OF PLANNED EFFORT AND ONLY THAT PORTION OF PHASE II ESSENTIAL TO THE PHASE I PROGRAM SHOULD BE IMPLEMENTED OR CONTINUED AND HIGHEST PRIORITY PORTIONS OF PHASE II PROGRAM INITIATED/ REQUEST ADVICE CONCERNING SPECIFIC INFLUENCE OF PHASE II FIRING SCHEDULE. SADDTIONAL FUNDS WILL BE MADE AVAILABLE AS SOON AS POSSIBLE
BT
THIS IS CAT "AC" NSC
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ADVANCED RESEARCH PROJECTS AGENCY
Washington 25, D. C.

ARPA Order No. 38-59
Amendment No. 2

April 1, 1959 Date

TO: Commander
Air Research and Development Command
Andrews Air Force Base
Washington 25, D. C.

✓1. Paragraph 6, ARPA Order No. 38-59, dated November 5, 1958, is superseded by the following. Attachment No. 1 to the basic Order is superseded by Attachment No. 1 to this Amendment.

> The Director, Advanced Research Projects Agency, will be kept informed of the status of work assigned under this Order by a Monthly Progress Report, a Quarterly Progress Report and a Semi-annual Technical Summary Report, to be prepared and submitted in accordance with procedures outlined in Attachment No. 1. These reports represent ARPA's presently foreseeable requirements for reporting under ARPA Order No. 38-59.

2. Distribution of AFBMD reports required by ARPA on work performed under ARPA Order No. 38-59 to agencies within USAF will be decided by AFBMD in consonance with established USAF procedures. Requests for copies of these reports by agencies outside USAF will be referred to ARPA for approval.

Roy W. Johnson
Roy W. Johnson
Director

34

DOWNGRADED AT 12 YEAR INTERVALS NOT AUTOMATICALLY DECLASSIFIED. DOD DIR 5200.10

1 Incl:
Attachment No. 1

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Copy to: Secretary of the Air Force
~~[illegible]~~ [redacted]
Cdr., AFBMD [redacted]

Upon removal of attachment this document becomes Unclassified.

C8-125670

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Attachment No. 1

ARPA Order No. 38-59
Amendment No. 2

PREPARATION OF REPORTS

I. Monthly Progress Report

a. Narrative Section. A letter report will be submitted by AFBMD giving a narrative account of work performed under ARPA Order No. 38-59. The letter report will cover work performed each month with the exception of the last month (March, June, September and December) of each calendar quarter. The quarterly progress report prescribed below will be submitted in lieu of the letter report for the last month of each calendar quarter. The initial letter report under this directive will be for the month of April 1959. Letter reports will be submitted in quadruplicate to the Director, Advanced Research Projects Agency, and are due within 10 days following the month reported.

The report will be in letter form, preferably not exceeding three pages, and will present a brief narrative summary of progress during the reporting period. Each report should make specific reference to the following topics: (1) technical status, (2) problems encountered, (3) work schedules, and (4) action required by ARPA. Photographs and illustrative material will be submitted as appropriate. The ARPA Order number, name of contractor, date of contract, contract number, amount of contract, and title of the project should be stated in the heading of each report.

b. Milestone Section. Instructions for preparation of a milestone progress report, which requires use of a standard format in reporting actual progress against planned progress in accomplishing major milestones, will be issued at a later date.

II. Quarterly Progress Report

The purpose of the quarterly progress report is to provide the President and the Secretary of Defense and their staff with periodic summary information by which they may be kept informed of overall progress and results in certain of the satellite projects.

Frequency and Due Date. The quarterly progress report will be prepared for submission to the President each calendar quarter and will show a summary of progress and significant events during

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the quarter. The report should reach ARPA no later than the 11th of the month following the close of the quarter reported. When the 11th falls on a non-workday, the report will be due the following workday. The initial report under this directive will be for the quarter ending March 31, 1959.

Content. The quarterly progress report will cover the progress, special achievements, problems encountered, schedules and overall status of the program. It is essential that the content be carefully organized and that the material is presented briefly, clearly and concisely.

Format.

PART A. Brief of Progress During the Quarter. The brief should not exceed one-half page in length and should present the outstanding highlights of progress and status of the program.

PART B. Topical Summary. The topical summary consists of a series of summary headings, each of which is followed by a summary paragraph or paragraphs. The summary paragraphs are not limited in number but generally should not exceed 15 lines in length. Each paragraph should be abstracted in a marginal heading appearing at the left margin opposite the first line of the paragraph. All elaborative detail should be relegated to Part C and reference noted thereto, as appropriate. Suggested summary headings for the MIDAS Project are:

MIDAS PROJECT

MIDAS FLIGHTS

Flight I
Flight II, etc.

FACILITIES AND SITES

Launch
Tracking

GENERAL

Infra-red Subsystem
(Certain basic subsystem hardware for the MIDAS Project presently being

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Attachment No. 1

ARPA Order No. 38-59
Amendment No. 2

of the report period. Upon completion of the project, a final report will be submitted summarizing the entire project. The final completion report will be submitted in lieu of the regular semiannual report to reach the Director, Advanced Research Projects Agency, within 60 days following project completion. The ARPA Order number, name of contractor, and title of the project should be stated in the heading of each report.

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OSR FILE 38-59

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ADVANCED RESEARCH PROJECTS AGENCY
Washington 25, D. C.

ARPA Order No. 38-59
Amendment No. 3 ✓

April 16, 1959 Date

TO: Commander
Air Research and Development Command
Andrews Air Force Base
Washington 25, D. C.

On the basis of an on-site detailed technical review of the MIDAS Phase I Development Plan, the $20,200,000 FY 1959 Phase I program relating to the four experimental flights is approved subject to the following changes:

1. The program objective shall be strongly reoriented to give a high priority to deriving from each flight a maximum of quantitative, scientific, and engineering data to insure the accumulation of sufficient data to:

a. Predict the success or failure of an alarm ✓ system in an operational role;

b. Permit progressive improvement of the alarm ✓ system during the development program; and

c. Permit design of other infrared equipment ✓ for optimized operational early warning or tracking system.

2. The contractor shall be directed to analyze quantitatively the gains in background rejection, possible through signal-data processing, for example for use of moving-target-indicator methods. ✓

Details on the above changes will be forwarded under separate cover.

In addition to Phase I, FY 1959 funds in the amount of $2,600,000 are authorized only for the urgent lead-time procurement ✓ required for boosters, vehicles and engines under Phase II.

Total FY 1959 funding in the amount of $22,800,000 mentioned above is contingent upon ARPA's receipt of additional funds from the Secretary of Defense Emergency Fund. In the interim, the fund availability is hereby increased from $8,000,000 to a new total of $10,800,000 under appropriation and account symbol "97X0113.002 Salaries and Expenses, Advanced Research Projects Agency, Department of Defense."

(signed)

[redacted] W. JOHNSON
Director

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INTERVALS; NOT AUTOMATICALLY
DECLASSIFIED. DOD DIR 5200.10

Cy to: Secretary of the AF

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Date 6 May 59

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COMDR, AFBMD, HQARDC, LOS ANGELES, CALIFORNIA
DIRECTOR
ADVANCED RESEARCH PROJECTS AGENCY
WASHINGTON 25, D. C.

INFO: COFS, HEDUSAF
WASHINGTON 25, D. C.

COMDR, AIR RESEARCH & DEVELOPMENT COMMAND
ANDREWS AIR FORCE BASE
MARYLAND

SECRET FROM WDZW 5-4-E FOR COLONEL SINEX, AFCGM-A AND AFDAT AT HQUSAF, COLONEL WORTHMAN AT ARDC. YOUR MESSAGE DEF 956704 20 MARCH INSTRUCTED AFBMD TO TAILOR THE MIDAS PROGRAM ON THE BASIS OF $22.79 MILLION FY 59 ARPA FUNDING. TO DATE, ONLY $10.8 MILLION HAS BEEN RECEIVED. IMMEDIATE PROGRAM APPROVAL AND FULL FY 59 FUNDING IS NECESSARY TO AVOID WORK STOPPAGE AT LOCKHEED ON 23 MAY. IF FUNDS HAVE NOT BEEN RECEIVED BY THIS DATE, THE NOVEMBER LAUNCH WILL SLIP ACCORDINGLY.

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INTERVALS; NOT AUTOMATICALLY
DECLASSIFIED. DOD DIR 5200.10

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FREDERIC C. E. ODER
Colonel, USAF
Deputy Director, Satellite Systems

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Captain N. Walecka/mrm
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HARRY L. EVANS
Colonel, USAF
Director, Satellite Systems

SECRET

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MEMORANDUM FOR THE ASSISTANT SECRETARY OF DEFENSE
(COMPTROLLER)

SUBJECT: FY 1960 Funds for MIDAS

Initial work on the Missile Defense Alarm System (MIDAS) is being funded by ARPA in FY 1959. ARPA funds for this purpose were increased by $12 million from the Emergency Fund. In approving the Emergency fund transfer, the Bureau of the Budget stated that such approval did not imply future fund approvals and requested that the program be presented to the NASC. Dr. York, in transmitting this request to ARPA, requested that he be kept fully informed of future developments.

All ARPA projects, including MIDAS, are being presented to the NASC at the June 29 meeting and this presumably will satisfy the Bureau of the Budget request. The ARPA 1960 budget has always indicated $18 million for MIDAS; it is understood that this is in the approved category, but that further transfers to the ARPA account for this project would be subject to the usual Bureau of the Budget approval.

18.

BMD's FY 1960 request for MIDAS R & D is 69.4 million including $40.5 from ARPA and $28.9 million programmed in the Air Force account. Additional sums of more than $40 million are programmed by the Air Force for items pertaining to the operational phase.

It is requested that action be initiated to transfer to the ARPA appropriation the $28.9 million that the Air Force has programmed in 1960 for the development stages of MIDAS.

It is suggested, pending the Bureau of the Budget approval of these funds, that in the FY 1960 letters of authorization or withholding, which it is assumed the Secretary will issue under a continuing resolution, the Air Force not be given authority to obligate MIDAS project funds.

Roy W. Johnson
Director

cc: Dr. H. F. York, Dir. Def. R&E
Secretary of the Air Force

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AIR FORCE BALLISTIC MISSILE DIVISION
HEADQUARTERS
AIR RESEARCH AND DEVELOPMENT COMMAND
UNITED STATES AIR FORCE
Air Force Unit Post Office
Los Angeles 45, California

from col Shepherd [illegible] [illegible] [illegible]

Assistant for Programming
WDPCR

8 May 1959

SUBJECT: Monthly Progress Report for the MIDAS Program

TO: Director
Advanced Research Projects Agency
Washington 25, D. C.

1. This report covers progress realized during the month of April 1959 in the MIDAS Program, directed by ARPA Order 38-59, prime contractor, Lockheed Missile Systems Division. The current funding for the MIDAS Program in Fiscal Year 1959 consists of $16.855 millions. The 30 January 1959 Development Plan requested $37.2 millions. A summary list of contracts is contained in Tab 3 of Section 1 of the Development Plan.

2. TECHNICAL STATUS

a. Baird-Atomic, Inc., is making satisfactory progress in the preliminary design of an advanced infrared scanner. One of two promising optical designs will be selected in early May. A study of radiation effects on lead-sulfide cells, transistorized amplifiers, and preamplifiers has been completed, and results are being analyzed.

b. Infrared Industries, Inc., has fifty percent completed the design of a special cone assembly to channel infrared energy to the detector. The objective of this effort is to achieve system sensitivity increase by a factor of approximately 3. This assembly is being considered for use in the Aerojet system.

c. A work statement was completed for the development of an infrared detector cooling system capable of reliable and long unattended life in the orbital environment.

d. The Philco Corporation has presented information concerning a non-rotating infrared scanner system. This area is being further investigated.

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3. **PROBLEMS ENCOUNTERED**

a. No specific technical problems have been encountered during the period covered by this report other than those described herein.

b. The management problem of outstanding concern to the MIDAS Program is the lack of program approval of Phase II and Phase III. This increases the difficulty of maintaining a balanced development program.

c. The launch stand and booster availability conflict between the NASA Man In Space Program and Phase I of MIDAS has been brought to the attention of ARPA. A copy of letter, subject: AFBMD Support of NASA/ARPA Space Programs at AMR; AFBMD, dated 18 March 1959, to the Director of Advanced Technology, Headquarters, USAF, has been furnished to ARPA. Immediate steps are required to resolve the difficulties described in this communication to prevent serious future delays to the MIDAS Program.

4. **WORK SCHEDULES**

a. Delivery of the first flyable infrared scanner was delayed by difficulties encountered in the vibration tests. The mirror mounting was then modified to prevent movement of the mirror under vibration, and the scanner passed the vibration and shock tests on 17 and 18 April without difficulty.

b. The Atomic Energy Commission has been informed of the requirement for nuclear auxiliary power (SNAP III) in the first MIDAS flight. Lockheed has authority to determine engineering costs, schedules, and design criteria prior to submitting a contract change number. This unit will power a 108Mc beacon and a visual (flashing light) beacon in the MIDAS Phase I flights.

c. Solar collectors for the test system for flights 1 and 2, Phase I, were received and are being inspected. The collectors will be installed on frames and fitted to the satellite; then removed and held in readiness at the launch site.

d. The telemetry system to be used with the acquisition beacon (supplemental to 108Mc beacon) has been designed, and five units are being fabricated; one each for vehicles for Phase I flights 1 and 2; one for qualification testing; and two spares. This acquisition beacon-telemetry system will provide 9 current, 1 voltage, 8 temperature, and 3 position (attitude) measurements for evaluating the nine solar collector test units which furnish power to the beacon and telemeter units.

e. The solar-array mockup for Phase I flights 3 and 4 is progressing on schedule. The extendable window-frames, vehicle housing and drive mechanism, heat motors (for orientation), and a breadboard of the electrical control system were completed.

f. The simulated altitude testing program of the MIDAS satellite engine has been completed at the Arnold Engineering Development Center. The results are currently being analyzed. Preliminary indications are that the engine may be stopped and restarted at altitude without a system for purging and repressurizing the thrust chamber before restart.

g. The design of equipment for MIDAS electrical mockup testing was begun. Included are the ground-space communications system, the infrared payload, and the telemetry system.

5. ACTION REQUIRED BY ARPA

Early release of remaining Fiscal Year 1959 funds for the MIDAS Program is necessary for uninterrupted program continuation and continuity. The MIDAS program is proceeding on the basis of $22.8 millions in contract funds from the Advanced Research Projects Agency and $1.4 millions from the Air Force for Fiscal Year 1959. This total is a reduction of $3.2 millions from the corresponding figures in the 30 January 1959 Development Plan. To date, ARPA has provided $10.8 millions and the Air Force has funded $5.855 millions; upon the receipt of the additional $12.0 millions due from ARPA, the Air Force funds will be adjusted down to the final figure of $1.4 millions, and the difference returned to Headquarters, USAF.

6. FACILITIES

a. Design of launch complex MIDAS, Vandenberg Air Force Base, will begin in May. Potential sites are under study.

b. A siting team completed site investigation for the North Pacific MIDAS station during mid-April. A site selection board convened in late April, and recommended Donnelly Flat. This location is within the reservation of Fort Greely, Alaska, about ten miles from the cantonment area.

c. An agreement has been reached concerning MIDAS Phase I program requirements at the Atlantic Missile Range. The agreement includes downrange radars and telemetry and telemetry readout at Cape Canaveral.

d. The ground command console required at the Atlantic Missile Range for MIDAS Phase I flights 1 through 4 is being procured.

e. Availability of the Trinidad radar for Atlantic Missile Range launches has been confirmed, and operation plan details forwarded.

Copies furn:
See attached list

RW Curtin for

O. J. RITLAND
Brig. Gen., USAF
Commander

45

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Ballistic Missiles Center (Hq AMC)	4
Assistant CINCSAC (SAC MIKE)	2

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TO COMDR AFBMD INGLEWOOD CALIF
BT
//S E C R E T//FROM AFDAT 51836
FOR WDZWM. THIS MSG IN 2 PARTS. PART 1. REFUR MSG WDZWM-5-3-E,
DTD 7 MAY 59. AFR 70-24A, 5 MAY 59, REMOVED 117-L PROGRAM FROM
MASTER URGENCY LIST AND SUBSTITUTED THEREFOR SENTRY AND DISCOVERER.
SEPARATE ACTION HAS BEEN TAKEN THRU JCS CHANNELS TO HAVE MIDAS
RETURNED TO THE MUL WITH A D-X PRIORITY. THE SECRETARY OF DEFENSE
IS NOW CONSIDERING THIS MATTER. APPROVAL OF A D-X RATING FOR MIDAS
MUST BE MADE BY THE NSC OR NASC. PART 2. WS 117-L IS STILL
CARRIED IN THE PD-61-2-1 (USAF PROGRAM -- BASES, UNITS AND
PRIORITIES), MARCH 58, AS AN AIR FORCE 1-A PRIORITY PROGRAM WITH A

GPB

PAGE TWO RJEZHQ 361
1-1 PRECEDENCE. THE NEXT ISSUE OF THIS DOCUMENT (JUNE 59) WILL
CARRY MIDAS, DISCOVERER AND SENTRY IN PLACE OF WS-117L WITH AN AIR
FORCE 1-A PRIORITY AND A 1-1 PRECEDENCE RATING.
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EXECUTIVE OFFICE OF THE PRESIDENT

BUREAU OF THE BUDGET

Washington 25, D.C.

18 May 1959

MEMORANDUM FOR: Mr. W. J. McNeil
Assistant Secretary
of Defense (Comptroller)

In reply to your request of April 15, 1959, the following transfer of funds is hereby approved under the authority of Public Law 724, 85th Congress:

From:

Emergency Fund, Office of the Secretary of Defense	$12,000,000

To:

Salaries and Expenses, Advanced Research Projects Agency, Department of Defense	$12,000,000

The foregoing transfer has been approved to support the MIDAS program with the understanding (1) that this approval is not to be construed as implying future funding approvals for the MIDAS program and (2) that the MIDAS project will be reported in detail to the National Aeronautics and Space Council prior to the preparation of the 1961 budget.

(signed)

W. F. Schaub
Chief, Military Division

3

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File

ARPA Order No. 38-59
Amendment No. 4

May 20, 1959 Date

TO: Commander
Air Research and Development Command
Andrews Air Force Base
Washington 25, D. C.

The fund availability for the MIDAS project is hereby increased from $10,800,000 to a new total of $22,800,000 under appropriation and account symbol "97X0113.002, Salaries and Expenses, Advanced Research Projects Agency, Department of Defense."

You are requested to submit a revised Development and Funding Plan to reflect the project as approved in Amendment No. 3 to this Order and the FY 1959 funding in the amount of $22,800,000. This Development and Funding Plan should indicate 1960 fund requirements.

Roger Johnson

Roy W. Johnson
Director

Copy to: Secretary of the Air Force

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     UNCLAS DEF411493 FROM OSD ARPA SGD GISE
     REFUR MESSAGE WDZW 5-4-E, AMENDMENT NO. 4 TO ARPA.
ORDR NO. 38-59 INCREASES THE FUND AVAILABILITY FROM $10.8
MILLION TO NEW TOTAL OF $22.8 MILLION. THIS INCREASE EFFECTIVE
TODAY
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CFN DEF41493 5-4-E 4 38-59 $10.8 $22.8
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c 20 May 1959

MEMORANDUM FOR THE COMMANDER, AIR RESEARCH
AND DEVELOPMENT COMMAND
ANDREWS AIR FORCE BASE

SUBJECT: Fund Allocation for MIDAS

Amendment No. 4 to ARPA Order No. 38-59 increased the funding of MIDAS to $22,800,000. This is based on the current approval to proceed with Phase I of MIDAS in an estimated amount of $20,200,000 and to apply $2,600,000 to urgent long lead time items of procurement required for boosters, vehicles, and engines under Phase II.

The increase of $12,000,000 provided in Amendment No. 4 was obtained by transfer from the Emergency Fund to ARPA. In approving this transfer, the Bureau of the Budget stated "that this approval is not to be construed as implying future funding approvals for the MIDAS program." A copy of the Bureau of the Budget's letter and the memorandum from the Director of Defense Research and Engineering, on the same subject, are attached for your information.

Until such time as ARPA approves Phase II, the ARDC should not exceed the program and funding authorizations contained in ARPA Order No. 38-59, dated November 5, 1958, as amended.

(covered #4, 20 May 59

Roy W. Johnson
Director

2 Incls.:
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FROM: COMDR AFBMD(ARDC) LOS ANGELES CALIF

TO: COFS USAF WASH DC

Info: COMARDC ANDREWS AFB MD

SECRET/FROM WDZO 5-5-E

HQ USAF FOR AFDAT ATTN: GENERAL BOUSHEY, AFCGM, AFCGM-A. HQ ARDC FOR RDZGW. REFERENCE IS MADE TO (1) LETTER, BMD TO AFDAT, HQ USAF, DTD 18 MARCH 1959, SUBJECT AFBMD SUPPORT OF NASA/ARPA SPACE PROGRAMS AT AMR; (2) TWX, BMD TO AFDAT, AFCGM, AFCGM-A, RDZGW, WDPP-4-3, 23 APRIL 1959. A DECISION ON THE MERCURY-MIDAS MESHED LAUNCH SCHEDULE IS NEEDED IMMEDIATELY. DELAY IS COMPOUNDING DIFFICULTY OF BMD SUPPORTING INITIAL PHASES OF BOTH PROGRAMS. THE APPROVED MIDAS PHASE 1 DEVELOPMENT PLAN SCHEDULES THE FIRST MIDAS LAUNCH FROM AMR STAND NUMBER 14 DURING NOVEMBER 1959. THE ORIGINAL PLANNING SCHEDULE FOR MIDAS CALLS FOR SOLE OCCUPANCY OF THE STAND

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DATE	TIME
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MONTH	**YEAR**
May	1959

WRITER

SYMBOL: WDZOR Cy No. 2 of 12 Cys.

TYPED NAME AND TITLE (Signature, if required): Lt Colonel Fields/bn

PHONE: 1316 PAGE NR. 1 NR. OF PAGES 2

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JOINT MESSAGEFORM - CONTINUATION SHEET

SECURITY CLASSIFICATION [redacted]

FROM: COMDR AFBMD(ARDC) LOS ANGELES CALIF

~~CONFIDENTIAL~~

BEGINNING IN LATE AUGUST 1959 AND A SLIP IN THIS SCHEDULE WILL REQUIRE ADJUSTMENT OF LOCKHEED CONTRACT. REFERENCE (1) INDICATES A LAUNCH DATE OF 15 SEPTEMBER FOR THE SECOND MERCURY SHOT. IF THE LAUNCH IS ACCOMPLISHED ON THAT DATE THE FIRST MIDAS SHOT WILL SLIP FROM THE DATE ORIGINALLY PLANNED BY APPROXIMATELY 3 WEEKS. CONVERSELY A DECISION TO MAKE STAND 14 AVAILABLE TO THE MIDAS PROGRAM IN AUGUST 1959 WOULD DELAY THE SECOND MERCURY LAUNCH UNTIL AT LEAST LATE DECEMBER 1959. IT IS CRITICALLY IMPORTANT THAT ARPA AND NASA BE BROUGHT TOGETHER BY YOUR OFFICE AT THE EARLIEST POSSIBLE DATE TO EFFECT A DECISION ON COMPROMISE LAUNCH SCHEDULES FOR MIDAS AND MERCURY.

~~CONFIDENTIAL~~

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FM HQ ARDC
TO AFBMD ARDC
BT
UNCLASSIFIED FROM RDZB-1-6-1-E.
SUBJECT IS WEAPON SYSTEM 117L "SUB-SYSTEM E". IN
ACCORDANCE WITH JOINT AIR FORCE/ARPA AGREEMENT,
YOUR FY 59 P-621 - 117L PROGRAM IS DECREASED BY
$4,455,000. COMPTROLLER, ARDC, HAS TAKEN ACTION
TO REDUCE BUDGET AUTHORIZATION ACCORDINGLY. THIS
ACTION WILL BE REFLECTED IN THE 1-AF-B21 REPORT
AS OF 31 MAY 1959.0
BT
01/1613Z JUN RJEZFF

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AIR FORCE BALLISTIC MISSILE DIVISION
HEADQUARTERS
AIR RESEARCH AND DEVELOPMENT COMMAND
UNITED STATES AIR FORCE
Air Force Unit Post Office
Los Angeles 45, California

REPLY TO
ATTN OF: WDPCR

8 June 1959

SUBJECT: Monthly Program Progress Report for the MIDAS Program

TO: Director
Advanced Research Projects Agency
Washington 25, DC

1. This report covers progress during the month of May 1959 in the MIDAS Program, directed by ARPA Order 38-59, prime contractor, Lockheed Missile Systems Division. During the month of May, Fiscal Year 1959 MIDAS Program funding was increased to $22.8 millions by Amendment No. 4, dated 20 May 1959, to ARPA Order 38-59. A summary list of contractors is contained in Tab 3, Section I of the Development Plan.

2. TECHNICAL STATUS

a. Representatives from ARPA and Chicago Midway Corporation (a consulting organization to ARPA) visited Lockheed Missile Systems Division (LMSD) to discuss possible modification of the infrared scanner focal plane assembly for Phase I flights. Changes will be incorporated in flights 3 and 4 to enhance background gradient measurements.

b. The Baird-Atomic, Inc. design for the thermal model of the infrared detector system was completed. The model of this design will be tested in the environmental chamber at LMSD to determine its capability to maintain an internal uniform temperature of -20° C. Design of the lead sulfide infrared detector configuration was completed. Orders for this small, intricate array of 175 detectors were placed with Infrared Industries.

c. All major problems concerning the interface between the signal processing electronics (Baird-Atomic, Inc.) and the data-link (LMSD) have been resolved. The data-link, a 256 channel system, is scheduled to be used with the Baird-Atomic, Inc., system in Phase I, flight 4.

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WDPCR-59-48
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d. In preparation for Phase I, flights 3 and 4, tests are being planned for the mechanics of the solar array control (heat motors, etc.). Thermal/altitude environmental runs will be performed in the environmental chamber at LMSD. One hundred eighty Type 3 Solar Collectors (14" x 17", approximately 10.7 watts per collector) are being fabricated, and an investigation is being conducted of coatings, covers and reflective surfaces to improve their emmissivity constants.

3. PROBLEMS ENCOUNTERED

a. The launch stand and booster availability conflict between the N.A.S.A. Man-in-Space Program, and MIDAS Phase I (see April report) remains unresolved.

b. Discussions were held at Syracuse, New York, with representatives of Rome Air Development Center (RADC), General Electric and Philco concerning the use of the RADC downrange tracking facility at the Atlantic Missile Range (AMR) for the MIDAS Program. Doubt exists as to the ability of this facility to track the satellite in the presence of stronger reflections from the booster. Study is being made of the possibility of using manual tracking if separation occurs close enough to the station for the equipment to distinguish between the two objects.

c. The uncertain and indefinite approval and funding of Phase II are becoming detrimental to orderly program accomplishment. This problem will become particularly acute on 1 July 1959 when FY 1960 efforts on all phases must be contracted for. The immediate approval of Phase II is needed urgently.

4. WORK SCHEDULES

a. In the auxiliary power system, the solar collector checkout console is being modified to accommodate flat collector assemblies rather than the curved assemblies for which it was originally designed. This console will be used for in-plant checkout purposes only. Testing at the launch bases will be accomplished by means of the portable solar collector checkout units. Drawings for the Phase I portable unit were released to LMSD Manufacturing on 29 April. Rough drafts of the acceptance test specifications and operating instructions for this unit are complete.

b. The Phase I payload checkout equipment for the collimator and adapter was completed. Drawings for the electronic portion of the payload checkout equipment are approximately 40 percent complete. Fabrication of the first set of equipment is in process, with efforts directed toward availability for in-plant use by mid-June 1959.

c. Four sets of the Otis Elevator equipment for checking out the guidance and flight control system are on hand at LMSD, Sunnyvale. Delivery of set No. 5 is expected in August 1959.

d. Design of the MIDAS launch complex at Vandenberg has been initiated, with a need date of June 1961.

e. Siting of a MIDAS readout station on Donnelly Flat, within the reservation boundary of Fort Greely, Alaska, has been approved by the Defense Department. Right-of-entry for purpose of investigation has been obtained from the Department of Interior. The Secretaries of the Air Force and Interior are taking combined action to secure congressional approval of construction. The preliminary design drawings are to be submitted by the Parsons Company on 6 June 1959.

f. Survey teams have selected four suitable locations for the MIDAS readout station on Thule Air Force Base. However, at all four sites, electrical interference from nearby equipment exceeds permissible limits. Methods of compromise are being studied.

g. Agreement was reached with the ground-space communications subcontractor (Philco Corporation) on methods of operating the Trinidad radar tracking station on Phase I flights. The station will not be supplied with automatic data transmission equipment or a teletype link. Data will be manually reduced and forwarded to Palo Alto as quickly as possible.

5. **ACTION REQUIRED BY ARPA**

Action by ARPA is needed on Phase II approval and funding level for FY 1960.

RJCurtin
for

O. J. RITLAND
Brig. Gen., USAF
Commander

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AFBMD	15

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AFBMD (ARDC) LOS ANGELES CALIF.

ARPA
WASH DC

INFO: COFS USAF
WASH DC

SECRET FROM WDZSM 6-2-E. INFO FOR AFDAP, AFDAT, AFCGM-A AT HQ USAF. THE APPROACHING FISCAL YEAR END FINDS MIDAS PROGRAM WITH PHASE I FULLY APPROVED AND ON SCHEDULE, PHASE II APPROVAL INDEFINITE, FUTURE FUNDING AND SCHEDULE UNCERTAIN, AND THE TOTAL PROGRAM FUNDING FOR FY 59 SHORT BY 3.2 MILLION DOLLARS. THESE UNCERTAINTIES IN PHASE II ARE CREATING PARTICULARLY ACUTE PROBLEMS. THE CURRENT MIDAS CONTRACT TERMINATES 30 JUNE 59 AND NEW CONTRACTS DEFINING SCOPE AND FUNDING FOR THE NEXT CONTRACT PERIOD MUST BE NEGOTIATED. CONTRACTOR PRICE PROPOSAL HAS BEEN PREPARED BASED ON TOTAL PROGRAM AS PRESENTED IN 30 JAN 59 DEVELOPMENT PLAN. TODATE THE INTENT OF ARPA ON PHASE II APPROVAL AND FUNDING FOR FY 60 HAS NOT BEEN MADE KNOWN TO AFBMD. IT IS IMPERATIVE THAT THE STABILITY OF THIS PROGRAM BE IMPROVED TO PRECLUDE SCHEDULE SLIPPAGE AND COST INCREASES. A MAJOR STEP TOWARDS

26 JUNE 59

SIGNED

WDZSM ~~CONFIDENTIAL~~

Major Thomas O. Weer /ss FREDERIC C. E. ODER
2741 1 2 Colonel, USAF
Director, Satellite Systems

WDZSM-503
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SECRET [redacted]

AFBMD (ARDC) LOS ANGELES CALIF.

SUCH IMPROVEMENT CAN BE ACHIEVED BY NEGOTIATION OF A NEW CONTRACT WHICH CLEARLY SPECIFIES AND DELINEATES THE SCOPE OF WORK AND FUNDING FOR THE CONTRACT PERIOD. A STATEMENT OF ARPA'S INTENTIONS WITH RESPECT TO PHASE II APPROVAL AND FUNDING IS URGENTLY NEEDED.

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WDGW-503
Cy 3 of 6

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AFBMD (ARDC) LOS ANGELES CALIF.

COFS USAF
WASH DC

SECRET FROM WDZSM 6-4-E. FOR AFDAT, AFBAP AND AFCGM-A. THE USAF HAS AVIDLY SUPPORTED AND IMPLIED APPROVAL OF THE MIDAS PROGRAM BY AIR STAFF ACTION ON FUNDING, ALASKAN SITE SELECTION APPROVAL, ETC.; HOWEVER, OFFICIAL APPROVAL OF THIS PROGRAM HAS NOT BEEN STATED. THE APPROACHING FISCAL YEAR END AND OUTLOOK FOR FY 60 FINDS PHASE I FULLY APPROVED BY ARPA, PHASE II UNCERTAIN AND INTENTIONS OF ARPA UNKNOWN, PHASE III APPARENTLY NOT AN ARPA RESPONSIBILITY. THE UNCERTAINTIES AND LACK OF APPROVAL OF VARIOUS PARTS OF THIS PROGRAM ARE CREATING ACUTE PROBLEMS. THE CURRENT MIDAS CONTRACTS TERMINATE 30 JUNE 1959 AND NEW CONTRACTS DEFINING SCOPE AND FUNDING FOR THE NEXT PERIOD MUST BE NEGOTIATED. CONTRACTOR PRICE PROPOSAL HAS BEEN PREPARED BASED ON TOTAL PROGRAM AS PRESENTED IN 30 JAN 1959 DEVELOPMENT PLAN. IT IS ESSENTIAL FOR THE STABILITY OF THIS PROGRAM TO PRECLUDE SCHEDULE SLIPPAGE AND COST INCREASE THAT CONTRACT CLEARLY DELINEATE AND DEFINE SCOPE OF WORK AND FUNDING FOR THE TOTAL PROGRAM

8
JUNE 59

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WDZSM
Major Thomas O. Wear
2741

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SIGNED
FREDERIC C. E. ODER
Colonel, USAF
Director, Satellite Systems

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DURING FY 60. TO PERMIT SUCH ACTION USAF INDORSEMENT OF PHASE I AND II AND APPROVAL OF PHASE III IS URGENTLY NEEDED.

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WDEW-507
Cy 2 of 6

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Transmittal of Revised Pages to ARPA Order 38-59, MIDAS Development Plan

Hq USAF (AFDAT)
Wash 25 DC

1. Twenty-seven copies of the revised pages of the 30 January 1959 MIDAS Development Plan conducted under ARPA Order 38-59 are transmitted for Hq USAF distribution and forwarding to ARPA.

2. Reference Amendments 3 and 4 to ARPA Order 38-59 which require submission of revised MIDAS Development and Funding Plans. The attached material consists of changes to the Funding Program shown in the MIDAS Development Plan dated 30 January 1959. The FY59 funds as approved by ARPA are shown in this revision. Also, the FY60 ARPA Fund Requirement has been increased from $30.0 millions to $40.5 millions. The increase results from: (1) coverage of the contractor requirements not funded during FY59, and (2) revised contractor estimates for FY60.

3. The referenced ARPA directives also require some reorientation of the technical aspects of the MIDAS Program. A revision now under study by AFBMD will consist of an increase in the operational altitude of MIDAS satellites to 2000 nautical miles. Studies of coverage at this altitude indicate that the number of satellites in the operational network will be reduced from twenty to twelve. The change will not affect FY60 funding, but may result in reductions beginning in FY61. The Program complying with ARPA instructions will be included in a later publication of the development plan which will be submitted with the initial FY61 Budget Estimate.

~~C E Hughes~~ Col, USAF

44 for O. J. RITLAND
Brig. Gen., USAF
Commander

1 Atch
Rev Pages to ARPA Order 38-59,
MIDAS Dev Pl (27 cys), WDTP-59-12

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FROM:

COMDR AFBMD (ARDC) LOS ANGELES CALIF

TO:

COMDR PMR PT MUGU CALIF

INFO: 1MISSLEDIV VANDENBERG AFB CALIF

SPECIAL INSTRUCTIONS

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SECRET FROM WDI-6-2-E

PURSUANT TO OUR WDIZ-6-2-E DATED 4 JUNE 1959 REPRESENTATIVES OF PMR, 1ST MISSILE DIVISION AND AFBMD INVESTIGATED POTENTIAL SITES FOR THREE MIDAS LAUNCH STANDS AT PT. ARGUELLO ON 5 JUNE. TWO AREAS, IDENTIFIED AS FOLLOWS, WERE PROPOSED FOR USE: PLAN 1 CONTEMPLATES DEVELOPMENT OF NEW AREA IN SOUTHWEST PORTION OF PT ARGUELLO IN VICINITY OF LA HONDA CANYON. PLAN 2 CONTEMPLATES EXPANSION OF SENTRY COMPLEX AREA FOR WHICH THERE IS ADEQUATE USABLE LAND AVAILABLE.

PAR. FOR FOLLOWING SIGNIFICANT REASONS, THIS HEADQUARTERS RECOMMENDS SITING OF MIDAS COMPLEX

65

DATE	TIME
11	
MONTH June	YEAR 1959

WRITER

SYMBOL WDI 11 JUN 1959

TYPED NAME AND TITLE (Signature, if required) Col W. E. Leonhard 9 Jun 59

PHONE 2874 PAGE NR. 1 NR. OF PAGES 3

SECURITY CLASSIFICATION [redacted]

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CHARLES H. TERHUNE, JR.
Colonel, USAF
Vice Commander

WDI-59-36 Cy 2 of 8 Cys

DD FORM 1 MAY 55 173 REPLACES DD FORM 173, 1 OCT 49, WHICH WILL BE USED UNTIL EXHAUSTED

~~CONFIDENTIAL~~

JOINT MESSAGEFORM - CONTINUATION SHEET

SECURITY CLASSIFICATION: [redacted]

FROM:
COMDR AFBMD (ARDC) LOS ANGELES CALIF (WDI-6-2-E cont'd)

UNDER PLAN 2 WITH STANDS LOCATED IMMEDIATELY WEST OF SENTRY COMPLEX ALONG EXISTING ACCESS ROAD:

1) PLACEMENT OF MIDAS STANDS IN THIS AREA WILL STERILIZE LEAST ADDITIONAL LAND AND RESERVE LAND PROPOSED UNDER PLAN 1 FOR FUTURE PROGRAM NEEDS.

2. OUR DESIGN AND CONSTRUCTION SCHEDULES CONTEMPLATED SITE ADAPTATION OF SENTRY STANDS NOW UNDER CONSTRUCTION. THIS CAN BE ACCOMPLISHED UNDER PLAN 2, BUT TOPOGRAPHY IN VICINITY OF LA HONDA CANYON WILL NECESSITATE FACILITY REDESIGN AND ADDITIONAL SITE DEVELOPMENT WORK. SCHEDULED NEED DATES FOR COMPLETED STANDS WILL NOT PERMIT THIS DELAY.

3. PLACEMENT OF MIDAS STANDS IN VICINITY OF SENTRY COMPLEX WILL PERMIT PLANNED UTILIZATION OF EMERGENCY POWER AND WATER SUPPLIES TO BE PROVIDED UNDER SENTRY PROGRAM.

4. IN CONSIDERATION OF 2 AND 3 ABOVE, IT IS APPARENT THAT AF FUNDS PROGRAMMED IN FY 60 WILL NOT BE ADEQUATE TO CONSTRUCT A COMPLEX OF THREE MIDAS STANDS IN THE NEW AREA PROPOSED UNDER PLAN 1.

5. FROM STANDPOINT OF UTILIZING EXISTING RI GROUND GUIDANCE STATIONS AT VANDENBERG AFB, PLAN 2 IS SUPERIOR TO PLAN 1.

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SECURITY CLA [redacted]

~~CONFIDENTIAL~~

FROM:
COMDR AFBMD (ARDC) LOS ANGELES CALIF (WDI-[illegible]-2-E cont'd)

6. PRIORITY AND IMMINENCY OF MIDAS PROGRAM WOULD APPEAR TO WARRANT FAVORED POSITION VIS-A-VIS VAGUE NEEDS OF LOWER PRIORITY TERRIER, HAWK AND AEROBEE PROGRAMS FOR AVAILABLE LAND BETWEEN SENTRY STANDS AND SURF.

7. FROM STANDPOINT OF INITIAL COST INVESTMENT, EXPANSION OF PRESENT SENTRY AREA WILL PERMIT COMMON USAGE OF EXISTING COMMUNICATION AND INSTRUMENTATION INSTALLATIONS.

8. ON CONTINUING BASIS, SIGNIFICANT SAVINGS IN MANPOWER AND COSTS CAN BE REALIZED BY CONSOLIDATING ACTIVITIES OF COMMON WEAPON SYSTEM CONTRACTORS ENGAGED IN SENTRY/MIDAS OPERATIONS. EXAMPLES INCLUDE NUMBER OF REQUIRED LAUNCH AND SERVICE CREWS; GUARD SERVICE; PAD MAINTENANCE, REHABILITATION AND REPAIR; FIRE PROTECTION; MEDICAL; AND TRANSPORTATION.

PAR. THE COMDR 1ST MISSILE DIVISION CONCURS IN THE RECOMMENDATION TO SITE THE MIDAS LAUNCH COMPLEX IN THE AREA IMMEDIATELY WEST OF THE SENTRY STANDS.

PAR. YOUR EARLY CONCURRENCE WITH THE ABOVE RECOMMENDATION IS REQUESTED IN ORDER THAT DESIGN AND CONSTRUCTION OF THE ADDITIONAL FACILITIES MAY PROCEED ON SCHEDULE.

67

SYMBOL	PAGE NR	NR OF PAGES	CLASSIFICATION	INITIAL
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NOTED 17 JUN 1959 09

INFO

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INFO COMDR 1ST MSL DIV
COMDR AFBMD FLD OFFICE VAFB
CNO
BUAER
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BT

//S E C R E T//YOUR 120145Z NOTAL. THIS MSG AMPLIFIES MY 091920Z.
AT NMFPA CONF 5 JUN PMR RECOMMENDED FOR 3 MIDAS LAUNCH STANDS ONLY THE 6 LAUNCH SITES VICINITY HONDA CAYON BTWN COORDS N413,000 TO N416,000 AND E1,209,000 TO E1,215,000 FOR FOLG SIGNIFICANT REASONS CLN

A. NMFPA GEN DEVEL PLAN REQUIRES MIDAS LONG TERM HIGH PRIORITY PROGRAM BE LOCATED AS FAR SOUTH AND WEST AS POSSIBLE TO PROVIDE MAX FREEDOM OF ACTION IN AREA APART FROM OTHER REASEARCH AND DEVEL EFFORTS. HONDA CAYON UNDEVELOPED AREA ALLOWS FUTURE EXPANSION WITHOUT VIOLATING NMFPA ADMINISTRATIVE AND INDUSTRIAL AREA AND PRESENT THE FUTURE PROGRAMS PLANNED BTWN SENTRY STANDS AND SURF.

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PAGE TWO CCN 40

B. GROUND AND FLIGHT SAFETY REQUIRE MIDAS PROGRAM BE LOCATED AS FAR SOUTH AND WEST AS POSSIBLE TO MINIMIZE EVACUATION OF PERSONNEL IN POLAR-LAUNCHED VEHICLE OVERFLIGHT AND FALLOUT AREA. HONDA CANYON AREA SITING MINIMIZES FUELING SAFETY PROBLEMS. NOT INHABITATED BUILDINGS PLANNED FOR FUTURE IN THIS AREA AND MIDAS LAUNCHES WOULD NOT RAQUIRE EVACUATION OF SENTRY COMPLEX PERSONNEL.

C. SOIL CONDITIONS AND TOPOGRAPHY RANGING FROM ABOUT 275 TO 850 FEET ELEVATION SIMILAR TO SENTRY LAUNCH AREA WILL REQUIRE MINUMUM FACILITY REDESIGN AND ADDITIONAL EARTH WORK CONSIDERED RELATIVELY MINOR ITEM.

D. SITE ADAPTATION CONSIDRED NORMAL REQUIREMENT OF ANY FACILITIES DESIGN AND SHOULD NOT DELAY DESIGN AND CONSTRUCTION SCHEDULE.

E. GUIDANCE LINE-OF-SIGHT EXISTS FROM VEHICLE ON RECOMMENDED SIES TO GUIDANCE SYS AT VAFB.

F. PMR FY 1960 MICON PROGRAM INCLUSES COAST HIGHWAY FROM SURF TO SUDDEN PROPERTY, POWER, WATER LINES AND ADQUATE TEST COMMUNICATIONS CABLING WITHIN SEVERAL HUN FEET TO RECOMMENDED LAUNCH SITES. NMFPA DEVEL PLAN INCLUSES FIRE PROTECTION, MEDICAL SERVICE, SECURITY GUARD SERVICE, AND TRANS FOR RECOMMENDED AREA. 68

G. NMFPA MASTER PLANNING PRECLUDES RELOCATION OF PROGRAMS LISTED

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PAGE THREE CCN 40
YOUR MSG AND SUSTANTIATES SITING MIDAS LAUNCH STANDS VICINITY HONDA CANYON PARTICALARLY FOR FUTURE OPERATIONAL REQUIREMENTS. BECAUSE MIDAS PROGRAM REQUIREMENTS NOT YET KNOW PMR REQUEST DETAILS ON ANY UNIQUE REQUIREMENTS PRESENTLY KNOWN THAT MIGHT DELAY DESIGN AND CONSTRUCTION OF MIDAS LAUNCH STANDS IN PMR RECOMMENDED AREA. TO EXPEDITE ACTION SUGGEST ADD PERTINENT INFO BE PRESENTED AT CONFERENCE WITH YOUR REPS AT PMR EARLIEST PARCTICABLE.
BT

"A-PARAPHRASE NOT REQUIRED EXCEPT PRIOR TO CATEGORY B ENCRYPTION - PHYSICALLY REMOVE ALL INTERNAL REFERENCES BY DATE-TIME GROUP PIROR TO DECLASSIFICTION."

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ADVANCED RESEARCH PROJECTS AGENCY
WASHINGTON 25, D. C.

ARPA Order No. 38-60
Amendment No. 5
Project Code No. 6100

July 1, 1959 Date

TO: Commander
Air Research and Development Command
Andrews Air Force Base
Washington 25, D. C.

ARPA Order No. 38, dated November 5, 1958, as amended, is hereby further amended to increase the fund availability from $22,800,000 to a new total of $27,050,000 under appropriation and account symbol "97X0113.002 Salaries and Expenses, Advanced Research Projects Agency, Department of Defense."

John E. Clark
Rear Adm., USN
Acting Director

Copy to: Secretary of the Air Force

70

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44

10 July 1959

ARDC (Lt General B. A. Schriever)
Andrews AFB
Wash 25, DC

Dear Ben

1. Your assurance of ARDC support of MIDAS as a ballistic missile early warning system is indeed gratifying. I will be happy to provide any and all assistance and information necessary to bring your staff up to date on MIDAS. As you know, Phases II and III of MIDAS have not as yet been approved by ARPA and the Air Force; however, we are taking all actions within the authority and approval we now have to maintain a program position to produce an operational MIDAS system at the earliest possible date.

2. It is suggested that the MIDAS briefing proposed in your letter of 22 June be scheduled for 22 July. I will assume approval of this date unless otherwise advised.

Sincerely

Original signed
O. J. RITLAND

O. J. RITLAND
Brigadier General, USAF
Commander

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ADVANCED RESEARCH PROJECTS AGENCY
WASHINGTON 25, D. C.

ARPA Order No. 38-60
Amendment No. 6
Project Code No. 6100

July 30, 1959 Date

TO: Commander
Air Research and Development Command
Andrews Air Force Base
Washington 25, D. C.

ARPA Order No. 38, dated November 5, 1958, as amended, is hereby further amended to increase the fund availability from $27,050,000 to a new total of $31,050,000 under appropriation and account symbol "97X0113.002 Salaries and Expenses, Advanced Research Projects Agency, Department of Defense." These funds provided as requested for continuation of work during August 1959.

John E. Clark
Rear Adm., USN
Acting Director

72

cc: Secretary of the Air Force

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46

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AIR FORCE BALLISTIC MISSILE DIVISION
HEADQUARTERS
AIR RESEARCH AND DEVELOPMENT COMMAND
UNITED STATES AIR FORCE
Air Force Unit Post Office
Los Angeles 45, California

REPLY TO
ATTN OF: WDFCR

7 August 1959

SUBJECT: MIDAS Program Progress Report, 31 July 1959

TO: Director
Advanced Research Projects Agency
Washington 25, DC

1. This report covers progress during the month of July 1959 in the MIDAS Program, directed by ARPA Order 38 (Project Code No. 6100). Prime contractor is Lockheed Missile and Space Division. ARPA funding for fiscal year 1959 was $22.8 millions. ARPA funding for fiscal year 1960 as requested in the 15 July 1959 Development Plan is $32.6 millions. A summary list of contractors is given in Tab 3, section I of the Development Plan.

2. **TECHNICAL STATUS**

a. The first ground presentation unit (Aerojet-General) was delivered to LMSD on 17 July. Compatibility tests were conducted with the airborne scanner and with a complete electrical mockup of the vehicle ground communications equipment. The equipment accepted and responded to beacon realtime and programmed commands, and transmitted payload information via the RF data link to the ground presentation equipment. Test results were satisfactory.

b. Under Aerojet-Generals' product improvement program, a scanner unit has been designed which is sufficiently sensitive to operate at 2,000 n.m. altitude. The design calls for mechanical modification of the basic scanner unit and elimination of the moving belt reticle and complex azimuth gear train. In conjunction with the resulting simplified electronic system, these changes would increase scanner unit reliability. Use of the design is contemplated for later Phase II flights.

13

c. A background measurements program is being investigated, consisting of a scanning radiometer mounted in a high-altitude aircraft. The radiometer would be capable of providing absolute radiance

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and irradiance difference scans at various look-angles. The program would be conducted by Baird-Atomic, Inc, and could furnish data on all types of clouds to be encountered on MIDAS flights.

d. Reports and Studies

(1) MIDAS Program United Kingdom Station Criteria, (LMSD-445488), dated 15 July, is a siting report to be transmitted to the British Air Ministry by the Air Force.

(2) MIDAS Defense Alarm Station - Facilities Criteria (Revision 1), (LMSD-445563). These two reports will be used as a guide to site selection and facilities design for a United Kingdom station.

(3) MIDAS Readout Stations, Requirements and Analysis Report on the Far North Sites (LMSD-445350), dated 29 June.

(4) Preliminary results of study and analysis of the possibility of using MIDAS for indirect bomb damage assessment indicate that all elements of the MIDAS Program can be used for this mission without interfering with the basic attack alarm function.

3. PROBLEMS ENCOUNTERED

a. The uncertain and indefinite approval and funding of Phase II are detrimental to orderly program accomplishment. The immediate approval of Phase II is needed urgently.

b. Because of a launch facility availability conflict with NASA, the MIDAS Program launch has been rescheduled from 18 November to 6 January 1960. ARPA has been asked to obtain NASA coordination on the proposed MIDAS launch schedules from January to 1 June 1960.

4. WORK SCHEDULES

a. Modification and checkout of flight vehicle 1008 is 42 percent complete, with delivery to Santa Cruz Test Base scheduled for 4 September.

b. Vehicle 1007, intended for captive testing, is to be renumbered as 1010 and used as the second flight vehicle. Assembly is nearing completion and the vehicle is scheduled for modification and checkout in October.

c. Basic structural design of the third flight vehicle, 1011, which includes lengthening the vehicle 16 inches to accommodate additional batteries, has been completed.

d. The Propulsion Checkout Console was shipped to AMR on 13 July. This console houses checkout systems for performing electrical circuit continuity checks, electrical and pneumatic component checks, and line and chamber leak checks of the MIDAS vehicle propulsion subsystem.

e. Two Solar Auxiliary Power Unit telemetry checkout consoles were shipped to LMSD Modification and Checkout center.

f. One high-pressure control console was shipped to AMR. The rolling ground console and power console will follow soon.

g. The infrared scanner power console and recorder console were completed.

h. Modification of AMR launch pad 14 is nearing completion on schedule. Ground support and ground checkout equipment required for activating the pad also are progressing on schedule. The site for Launch Complex No. 2 (Point Arguello, Calif.), has not been approved. Preliminary design of all items not affected by siting has been completed.

i. A construction contract for the North Pacific Station at Donnelly Flats was awarded and work commended during July. A contract will be awarded during August for construction of the foundation of the support building located at Fort Greely.

5. ARPA ACTION REQUIRED

a. ARPA action is needed on approval and funding level for Phase II.

b. ARPA efforts in obtaining NASA coordination on proposed MIDAS launch schedules is requested.

O. J. RITLAND Col USAF
Maj. Gen., USAF
Commander

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See attached Distribution

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ACTION: WDZS/WDZ

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//S E C R E T//DEF 963871 FROM ARPA SGD CLARK REFERENCE WDZSM-7-9-E.
FOR GUIDANCE AND IMMEDIATE IMPLEMENTATION MIDAS PROGRAM PHASE I APPROVAL FOR 4 SHOTS IS RECONFIRMED AND PHASE II IS APPROVED FOR 6 ADDITIONAL SHOTS SUBJECT TO THE FOLLOWING CLN
1. FIRST 2 PHASE I LAUNCHINGS ONLY WILL BE CONDUCTED AT AFMTC, FLORIDA. IN CONJUNCTION WITH NASA AGREEMENT, PLANNING FOR THESE SHOTS SHOULD ASSUME INITIAL OCCUPANCY OF STAND 14 AT AMR IN OCTOBER 1959 AND RETURN OF STAND AVAILABILITY TO NASA IN MARCH 1960.
2. SUBSEQUENT LAUNCHINGS SHALL BE CONDUCTED FROM THE PACIFIC COAST WITH A PROGRAMMED SCHEDULE PHASED THROUGH CY 1961 TO PERMIT SMOOTH

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PAGE TWO RJWZNF 19F
TRANSITION TYCEERATIONAL SYSTEM LAUNCHES IN EARLY CY 1962 CONTINGENT UPON APPROPRIATE OPERATIONAL SYSTEM DECISIONS IN EARLY FY 1961.
3. PROGRAMMED FY 60 FUNDS FOR PHASES I AND II SHALL NOT EXCEED THE $46.3 MILLION APPROVED.
PHASE III IS NOT APPROVED AT THIS TIME. PHASE III EFFORT IS LIMITED TO PLANNING AND STUDIES ONLY. PHASE III FY 60 BUDGETED FUNDS AND FACILITIES PROGRAMMED FOR THIS PURPOSE ARE BEING WITHHELD UNTIL FURTHER NOTICE. PARTICULAR FACITITIES REQUIRED TO PROTECT NECESSARY LEAD TIME ASSOCIATED WITH THIS REVISED SCHEDULE MAY BE AUTHORIZED SUBJECT TO INDIVIDUAL JUSTIFICATION AND REVIEW AFTER PROGRAM REORIENTATION. DETAILED GUIDANCE AND FUNDS AUTHORIZATIONS WILL BE PROVIDED BY APPROPRIAE ARPA ORDER 38 AMENDMENT
BT
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2 . AUG 1959

(U) MIDAS-Personal Letter to Dr. York

ARDC (Lt General Schriever)
Andrews AFB
Wash 25, D.C.

1. The attached draft of a proposed personal letter to Dr. York has been prepared and submitted in accordance with your desires.

2. Dr. York was given a 20 minute briefing on MIDAS during his visit to AFBMD on 19 August 1959. Material covered included scientific and engineering data on which the MIDAS system is based, the design solutions examined and underway, the technical parameters of the present design concept and why they were chosen, and a description of the research, development and test program and how it highlights the problems identified and recognized by LMSD, AFBMD, ARPA and other technical review groups.

3. The inadequacy of the FY-60 funding was pointed out to Dr. York in summary statements after the briefing. His reply was, in effect; if the MIDAS is funded at a higher level it must be done at the expense of other program reductions - there are only so many dollars.

SIGNED

CHARLES H. TERHUNE, JR.
BRIGADIER GENERAL, USAF
VICE COMMANDER

1 Atch
Draft letter to Dr. York (S)WDZS-4, 1cy w/5 atch: (1)Rpt of Ad Hoc Tech Adv Bd to ARPA (S)(1018563) (2)Excerpts fr "Final Rpt of Ad Hoc Com on Air Def Sys" dtd 15 Jan 59, SAB (S) WDSP-1 (3)Memo fr Sec of Def, 12 Feb 59 (S) WDGMU-63-50 Series A (4)Memo to COFS, USAF, subj: (U) Priority of WS 117L Prog for Early Warning 8 Nov 58 (DWL-SAC/MIKE) (5)Ltr to JCS fr Gen Partridge, subj: WS 117L Infrared Satellite Prog (S)

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WDZS-4

DRAFT [redacted] CONFIDENTIAL DRAFT

Dr. Herbert F. York
Director of Defense Research and Engineering
Washington 25, D.C.

Dear Dr. York

1. I have just learned of the decision to place some rather severe restrictions on the MIDAS development program which will jeopardize the early attainment of an operational capability. This decision causes me grave concern. I have little doubt the advent of the ballistic missile with its inherent capability of massive, annihilating, rapid attack has made the major military problem facing this nation one of retaining adequate strength to deter all-out war. The role of the MIDAS has not heretofore been directly associated with our deterrent posture, yet it is obvious that with ballistic missiles traveling 5,000 miles in approximately 30 minutes, the value of early warning of enemy ICBM launchings has assumed unprecedented importance. Through our policy of peaceful aims we have generally conceded the Soviets have the initiative. However, if positive warning that a Soviet missile attack has been launched exceeds in minutes the reaction time of our own missiles, and they know it, they would be strongly deterred from initiating such an attack. The MIDAS, in conjunction with BMEWS, makes this possible.

2. As early as 1947 the Air Force established at RAND a program of study and experimentation to establish the feasibility of and criteria for a reconnaissance satellite. In 1954, when the Air Force Ballistic Missile Division was established, it was realized that the expedited development of the ballistic

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missile must be accompanied by the simultaneous development of a method of deterring its use. At that time the Air Force Satellite Program was transferred to the AFBMD to expedite its development. Since that time the requirements have been defined in detail and their urgency greatly increased by our assessing our own technical advances and technical intelligence of Soviet's activities. During this period all aspects of the MIDAS has been thoroughly studied and evaluated by contractors to the AFBMD, my military staff and technical groups available to me in the AFBMD management structure. I have personally examined the progress made and have been satisfied with the progress made before permitting each successive step in the development process to proceed.

3. The DISCOVERER tests now in progress are adding significant substantiation of the feasibility of the MIDAS system by providing an immense wealth of scientific and engineering data to provide for functional design and reliability improvements in the MIDAS system. In addition, the first MIDAS IR flight package has been delivered and is undergoing extensive laboratory system testing in conjunction with the companion ground gear prior to its first flight test. Although the first unit is not of operational flight quality it's performance during the extensive ground tests verifies the fact that the performance requirements of an operational system, based on the design concepts used, is well within the capabilities of the present state-of-the-art. These conclusions are shared by technical groups outside the AFBMD who have examined the MIDAS system. Excerpts from the reports of these groups are attached for your consideration.

4. Considering the urgency of the national requirements as stated by the Air Force, and verified by letters from CINCNORAD and CINCSAC (copies attached), I am convinced that the potential of the MIDAS must be exploited fully and expeditiously. Every effort must be made to compress time to the first operational capability by concurrency of development. To realize the earliest possible capability in MIDAS, steps must be taken now to provide for the industrial bases for its production, operational facilities for its operation and maintenance, command and communications system for its operational control, the supply and transportation system for its support, training facilities and instructors, and finally, organization and trained people to operate the system. This management concept of concurrency, first used on the ATLAS at AFBMD, provides for the integration of each element of the total weapon system into a single plan, program and budget all implemented concurrently, consistent with lead time requirements.

5. MIDAS development plans submitted and presented to the ARPA and the funding associated with these plans have been based on the concept of concurrency for the weapon system. Fund limitations placed on the R&D program in FY-60 and the associated stretch-out will seriously restrict development activities and will delay the early attainment of an operational system. Delay in the approval and appropriate funding of MIDAS in FY-60 and 61 as an operational system based on the concept of concurrency will cause further and even greater delay in the attainment of a capability that is gravely important to the national survival. Technical problems associated with the detection of a ballistic missile against daytime radiation background fluctuations are fully recognized as well as the serious and ever present problem of the space system reliability. The development and test program is oriented to emphasize the early solution of these

problems which although serious appear to be solvable. I strongly urge that the calculated risks involved in the development of the MIDAS system under the concept of concurrency and under the highest national priority is justified by the urgency of the requirement and the existing proof of its feasibility.

Sincerely

5 Atch

1. Rpt of Ad Hoc Tech Adv Bd to ARPA (S) (1018563)
2. Excerpts fr "Final Rpt of Ad Hoc Com on Air Def Sys" dtd 15 Jan 59, SAB (S) WDZP-1
3. Memo for Sec of Def, 12 Feb 59 (S) WDGMU-6.5-50 Series A
4. Memo to COFS,USAF, subj: (U)Priority of WS 117L Prog for Early Warning, 8 Nov 58 (DWL-SAC/MIKE)
5. Ltr to JCS fr Gen Partridge, subj: WS 117L Infrared Satellite Prog (S)

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ADVANCED [redacted]ECTS AGENCY
WASHINGTON 25, D. C.

ARPA Order No. 38-60
Amendment No. 7
Project Code No. 6100

August 26, 1959 Date

TO: Commander
Air Research and Development Command
Andrews Air Force Base
Washington 25, D. C.

1. ARPA Order No. 38, dated November 5, 1958, is hereby amended to clarify and emphasize program objectives, and to establish tasks to be performed. Tasks cited are subject to maximum funding level of $46.9 million for FY 1960.

A. ARPA objectives in the Phase I MIDAS program are:

(1) To gather from limited tests in orbital flight maximum engineering and scientific data pertinent for:

(a) Guiding further MIDAS system and equipment development.

(b) Enabling high-confidence prediction of MIDAS performance under all operating conditions.

(2) To develop appropriate and reliable data-gathering equipment, including infrared sensing equipment and stabilized satellite vehicles, to implement objective (a).

(3) To check in orbital flight the operation of equipment developed.

(4) To perform studies aimed at optimization of system design in the light of best available data.

Emphasis is required on optimization of quantity and quality of statistical data gathered on signals produced by missile targets and by disturbing backgrounds, such as clouds. Particular emphasis is also required on development and design for maximum reliable equipment life in orbit.

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ARPA Order No. 38-60
Amendment No. 7
Project Code No. 6100

B. Approval is provided for continuation of MIDAS Phase I by performance of the following tasks:

(1) Prepare all equipment for and carry out 4 launchings of MIDAS vehicles, launches 1 and 2 from Atlantic Missile Range beginning in January 1960.

(2) In consonance with AMR stand limitations and ATLAS D delay, reprogram to accommodate launches 3 and 4 into polar orbit from the Pacific Coast beginning approximately July 1960.

(3) Record and analyze infrared-signal and equipment-performance data produced by these 4 flights.

(4) Maximize statistical background data by providing maximum geographic readout coverage, particularly in areas having strong cumulo-nimbus cloud activity at the season of launch.

Specifically, investigate and report to ARPA within 30 days on possibility of providing for MIDAS data-link reception and recording through the large steerable reflectors on Trinidad and at Prince Albert in Canada. Study and report, also, on feasibility of data reception and recording through any of several TLM-18 facilities now existing in Turkey.

(5) Procure earliest modification of focal-plane assemblies and amplifiers of infrared scanners to provide:

(a) Optimized capability for gathering background data suitable for statistical analysis.

(b) Noise data on unilluminated cells in presence of van Allen or other radiation.

(c) Signal-level data accurate within ± 2 decibels or better.

(d) Assurance of no signal-channel overloading under any condition to be encountered in orbit.

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ARPA Order No. 38-60
Amendment No. 7
Project Code No. 6100

(6) Program modified scanners as primary payloads on the earliest flights possible, using earlier scanners as back-up payloads, (with retrofit modification if possible). Take maximum advantage of above revised firing to insure most advanced data-gathering capability possible as payloads on all flights.

(7) Continue development and testing of subsystem equipment for improved performance and reliability applying intensive effort to improvement of reliability.

(8) Perform rigorous life tests and captive tests in support of development program, with emphasis on tests early and complete enough for results to benefit flight program.

(9) Continue system-optimization studies.

(10) Analyze quantitatively gains in false-alarm rejection practically obtainable by data-processing methods, such as the infrared analog of radar area MTI.

(11) Plan experiments to gather maximum data in orbit for other wavelength bands than 2.7 microns, with particular attention to 4.3 microns (CO2 absorption) and 0.25 micron (ozone absorption). Include such experiments on late Phase I flights.

(12) Plan experimental program procedure to be followed in event of total failure of flights 1 and 2 to produce useful infrared data.

C. Approval is granted for initiation of a Phase II MIDAS program. Objectives are as stated in A above, together with those of maintaining sufficient program fluidity to take full advantage of information gained from Phase I and early portion of Phase II, and of assuring suitability for later operational use in equipment developed. Tasks to be performed in the Phase II program are:

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(1) Provide equipment for and carry out at least 6 launchings into polar orbit from the Pacific Coast--following, in proper interval, launch of flight 4 of Phase I. Time phasing should be scheduled through CY 1961 to permit smooth transition to operational system launches consistent with assumed operational system approval in early FY 1961.

(2) Plan and operate Flights 5 through 8 as an extension of the Phase I equipment - development and data-gathering effort.

(3) Record and analyze infrared-signal and equipment-performance data produced by these flights.

(4) Program booster and orbital vehicles of Flights 9 and 10 as alternates to insure accomplishment of objectives of Flights 5 through 8, if needed.

(5) Plan and operate Flights 9 and 10, unless vehicles are needed earlier as alternates, to establish suitability of equipment prototypes for the operational system, including ground equipment and environment.

(6) Introduce extended-capability (dual burn) AGENA satellite vehicles as early as possible to provide earliest data from high-altitude orbits.

(7) Introduce precise position control of vehicles in orbit as early as possible.

(8) Maximize statistical background data by providing maximum geographic readout coverage, particularly in high latitudes. Specifically, assure earliest availability for MIDAS data recording of one far northern receiving facility equipped with a large steerable antenna. Investigate feasibility of recording MIDAS data through the large steerable antenna planned for early operation in Japan.

(9) Carry out experiments on Phase II flights to gather data in orbit on target and background signals in other wavelength bands than 2.7 microns, with particular attention to 4.3 and 0.25 microns.

C9-116941

(10) Continue development and testing of equipment for improved performance and reliability. This includes ground equipment.

(11) Submit within 30 days a study report detailing the factors which have led to amendment of the MIDAS Development Plan of January 30, 1959, changing the recommended operational satellite deployment from 20 vehicles in random orbits at 1000 miles to 12 vehicles in random orbits at 2000 miles. In particular, engineering data and analysis are required in support of infrared target-detection and background-rejection feasibility at the increased maximum range. Firm recommendation as to use of precise control of relative position in orbit, with full engineering analysis support, is also required in this report.

(12) Study and report on degree and feasibility of improvement in over-all operational-system performance and geographic alarm coverage attainable by use of additional operational ground readout stations. Particular attention is to be given to such station locations as Turkey and Japan, especially with regard to feasibility of assuring unbroken data transmission from them to the continental United States in the 1962 time period.

(13) Establish finalized operational-system concept and specifications prior to fabrication of equipment for Flights 9 and 10. Take maximum advantage of information gained from Phase I and Phase II programs to determine technical limitations which shape operational-phase objectives.

(14) Study and report on consequences of eliminating from the satellite-borne equipment all commanded or programmed functions, except those required to establish the satellites in precise orbits and orbital positions. State characteristics of a system optimized for such operation.

(15) Study methods of processing data from satellites to provide automatic and unambiguous recognition of missile targets. Conduct preliminary-design analysis of most promising methods.

(16) Study methods of improving data transmission from satellites to using agencies, looking toward improvement of extent, reliability, and effectiveness of surveillance coverage.

(17) Continue study of areas of growth in system utility, such as: effective impact-area prediction when many missiles are launched at once, with its attendant data-correlation problems; improvement in system ability to resist possible counter-measures; and partial in-satellite data processing.

D. Tasks beyond the scope directed may be undertaken, or effort on directed tasks deleted, only with concurrence of ARPA.

E. Phase III is not approved at this time. Within limits of funds availability, Phase III oriented studies may be conducted. In order to achieve even limited operational capability in Calendar Year 1962, portions of the Phase III program dealing with facilities may require initiation in FY 1960. Therefore, after program reorientation in accordance with guidance and authorizations provided, particular long lead time facilities may be authorized subject to individual review of justification.

F. ARDC is requested to submit within 30 days a revised Development and Funding Plan for approval. The Phase I, Phase II nomenclature shall be eliminated and the 10 shot program integrated into one research and development phase. The revised development plan should include total funding required by fiscal years to complete the R&D phase with the FY 1960 portion thereof, not to exceed $46.9 million. Current plans for an operational system should be included.

G. The fund availability under this Order is hereby increased from $31,050,000 to a new total of $35,550,000 under appropriation and account symbol "97X0113.002 Salaries and Expenses, Advanced Research Projects Agency, Department of Defense."

Roy Johnson

Roy W. Johnson
Director

c: Secretary of the Air Force

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WDZSM/Col Norman/2594

2 September 1959

Reorientation of the MIDAS Program

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1. Consistent with recent ARPA instruction, a conference was convened at AFBMD on 26 August 1959 to realign the MIDAS Program and to determine resultant courses of action which must be followed. The agreements reached and instructions which are being transmitted to LMSD are as follows:

A. General

1. There have been no changes in the ultimate goal of the MIDAS Program to develop an operational early warning system as established GOR 80-3 and 3a. Orientation of the development program leading to the attainment of the operational capability is directed by ARPA Order 38-59 and appropriate amendments. ✓

2. The reoriented MIDAS Program is to be subdivided into an R&D Phase and an Operational Phase. The R&D Phase is to consist of ten (10) R&D launches through the period Jan 60 to Dec 61. The first two launches will be from pad 14, AFMTC in Jan and March 1960. The subsequent eight (8) launches will begin July 1960 from Point Arguello Complex #1 pad B, and continue at a rate appropriate to the complexity of test being accomplished and pad availability through the period ending Dec 61. The operation launches are planned to begin Jan 62 and continue at a planning rate of 3 launches per month until the operational net is established; and thereafter at a rate consistent with maintenance of the net. The former Phase I and II MIDAS programs have been combined and re-termed "MIDAS R&D Program". The former MIDAS Phase III Program has been re-termed "MIDAS Operational Program".

B. Program Objectives

1. Research and Development

a. To gather from tests in orbital flight maximum engineering and scientific data for:

(1) Guiding further MIDAS systems and equipment development.

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310

(2) Predicting the capability of MIDAS performance under all operating conditions.

(3) Evaluating in orbital flight the operation of equipment developed.

(4) Optimizing equipment design for an operational system.

b. Flight test should be oriented to;

(1) Attain high altitude performance in early flights.

(2) Introduce extended capability (dual burning) as early as possible, preferably by Flight 5.

(3) Introduce test of precision positions control of vehicles in orbit as early as possible.

(4) Establish operational prototype vehicle design for flight tests in Flights 9 and 10.

c. Other activities to be included during R&D Phase:

(1) Continue preliminary design, fabrication and plan flight tests of tracking and reference equipment leading towards establishment of the state of the art for these components as applicable to tracking and prediction capabilities from satellites.

(2) Fabricate and install minimal equipment required for readout and test at Alaskan (Fort Greely) readout station.

(3) Conduct that reliability study and test program required to adequately support the one year operational objective.

2. Operational Program

a. The operational phase is not approved or funded and only minor planning activity can be conducted at this time.

(1) Continue planning and study activities leading towards selection and siting of operational facilities.

(2) Develop schedule of facilities and established decision dates for go ahead required to meet operational dates.

C. Miscellaneous Instructions

1. LMSD will provide the following documents to AFBMD:

a. Reoriented MIDAS Development Plan on or about 15 Sept 59.

b. New schedule of program milestones (LMSD 2800 type) on or about 15 Sept 59.

c. A separate report on or about 15 Sept 59 identifying critical decision items and related decision dates for facilities and other work required for a MIDAS operational program beginning in Jan 62.

d. New contract Work Statement and Program Objectives on or about 5 Oct 59.

e. New MIDAS Cost Proposal covering the period from the present to Dec 61 due on or about 27 Oct 59.

2. The present stop work order presently invoked on LMSD will be lifted. Levels of expenditures have been established for LMSD in consonance with the funding limitations ($46.9 Million for FY 60) placed on the R&D Program by the ARPA Directive. LMSD will also be authorized to complete work on the MIDAS Systems Engineering Analysis Report.

3. This information is furnished to provide a basis for MIDAS planning, programming, program direction and funding action subsequent to 26 August 1959.

for QUENTEN A. RIEPE
Lt Colonel, USAF
Director
MIDAS Satellite System

1 Atch
Program Schedule
as of 26 Jul 59

52

PROGRAM SCHEDULE

A/O
26 Jul 59

MIDAS
(Re-oriented)

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LAUNCH SCHEDULE

RESEARCH & DEVELOPMENT
- AMR, PAD #14
- Pt. Arguello, Complex #1

OPERATIONAL
- Pt. Arguello, Complex #2

LAUNCH FACILITIES
- Building "E", AMR
- PAD #14, AMR
- *Pt. Arguello, Complex #1
- Pt. Arguello, Complex #2
- GMAB (VAFB)

GROUND STATIONS
- *VAFB Data Acq'n & P. (Addition)
- Hawaii
- *Northeast (Addition)
- *Central (Addition)
- *Northwest (Addition)
- Alaska
- Greenland
- United Kingdom
- *DCC
- .Telemetry Ship

LEGEND
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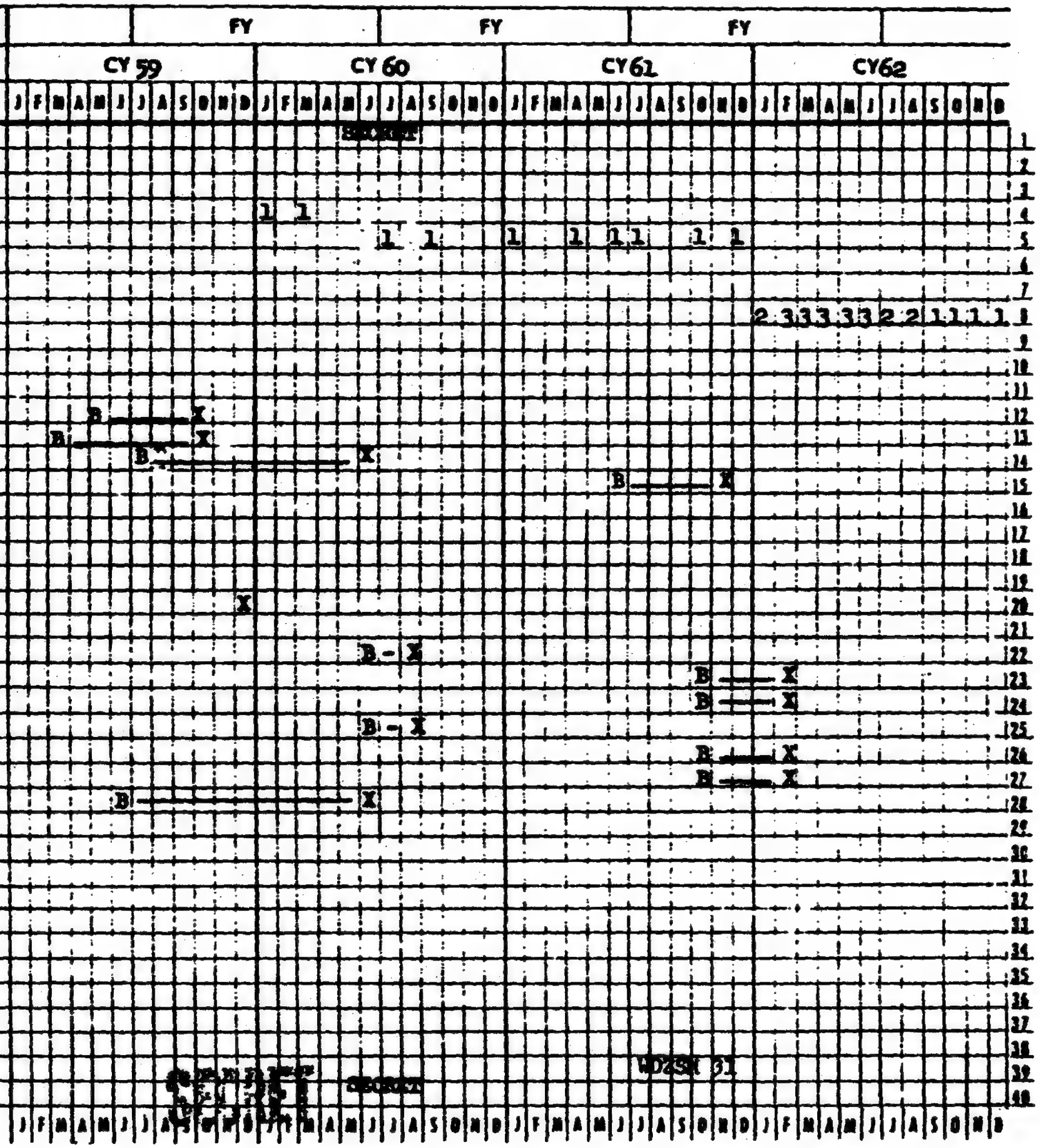
- . - Avail from DISCOVERER



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51

AIR FORCE [illegible] DIVISION
HEADQUARTERS
AIR RESEARCH AND DEVELOPMENT COMMAND
UNITED STATES AIR FORCE
Air Force Unit Post Office, Los Angeles 45, California

REPLY TO
ATTN OF: WDPCR

SUBJECT: MIDAS Program Progress Report, 31 August 1959

8 September 1959

TO: Director
Advanced Research Projects Agency
Washington 25, DC

1. This report covers progress during the month of August 1959 in the MIDAS Program, directed by ARPA Order 38 (Project Code No. 3600). Prime contractor is Lockheed Missile and Space Division. ARPA funding for fiscal year 1959 was $22.8 millions. The presently approved ARPA funding level for fiscal year 1960 is $46.9 millions. A summary list of contractors is given in Tab 3, Section I of the Development Plan. As a result of the August 1959 message directive from ARPA, a joint LMSD/AFBMD/BMC MIDAS Program reorientation conference was convened on 26 August. In accordance with ARPA instructions, the program was redefined into R&D and operational phases. Lockheed was instructed to prepare a new contractors' development plan and cost proposal to be available for review approximately 15 October 1959. A new work statement is being prepared. Program planning and funding directives have been issued to Lockheed to permit continuation of the program.

2. **TECHNICAL STATUS**

a. The infrared detection system (Baird Atomic, Inc.) is being modified to include a radiometric background measurement capability, tentatively scheduled for installation on Flights 3, 4 and 5. Measurements will be made above the horizon, just below the horizon and at four other intermediate points of view. The irradiance will be determined for spectral bandwidths between 1.8 and 3.0 microns, 2.65 and 2.80 microns, and an intermediate bandwidth yet to be determined.

b. The development work at Infrared Industries, Inc., has been extended to include an investigation of the performance of lead sulfide detectors at temperatures down to -80°C. The investigation was initiated because of the low temperatures obtainable through use of passive cooling techniques.

c. After the new high-precision gears were installed on the azimuth drive, the first scanner unit (Aerojet-General) was tested and the desired constant rate of rotation obtained.

3

d. Work statements for infrared reconnaissance situation display consoles have been submitted to subcontractors for bids. Six units of

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two types are requested for delivery by September 1960. Display consoles will be used to monitor data as it is transmitted; and summary display consoles, having all the features of the data display units, will have the additional capability of evaluating and summarizing incoming data for display. These units will replace the analog display systems developed during the early stages of the program, permitting the entire system to be driven digitally by means of the computer equipment. They will meet the later developmental and early operational system requirements.

e. A reliability study of the first vehicle has been initiated and weight factors have been completed in detail. Reliability requirements for the horizon scanner, horizon sensor and inertial reference package have been outlined in work statements.

f. The timer-period display for the vehicle command control console and panel were reviewed. It has been recommended that a direct digital period display be substituted for the proposed frequency display, and that the step command counting system be controlled by step command control rather than by a separate control.

3. PROBLEMS ENCOUNTERED

Currently authorized program objectives require a readout capability in the North Atlantic area. This capability is funded in the operational phase. Although originally envisioned in terms of its function in the operational program, the North Atlantic Station was to have been funded early in order to utilize its readout capability in support of the R&D program, essentially affecting an economy in station utilization. Since operational phase funding is currently being withheld, work on equipment for this station cannot be undertaken.

4. WORK SCHEDULES

a. On 24 August the infrared scanner payload package was mated with the first flight vehicle and alignment was accomplished successfully. Modification and checkout of this vehicle is now 80 percent complete, with delivery to Santa Cruz Test Base (SCTB) scheduled for 4 September. Work on subsequent flight vehicles continues essentially on schedule, with the second vehicle scheduled to enter modification and checkout on 22 September.

b. The first two of four solar collector checkout units are undergoing modification of the light source assembly. The first infrared payload checkout complex and a PAM/FM data link checkout console were shipped to LMSD modification and checkout center during the month.

c. Operational difficulties revealed by initial tests of the first Fairchild Programmer have been corrected and a second test has been scheduled to support modifications.

[redacted]

d. A meeting was held at AMR to familiarize base personnel with the general characteristics of equipment to be used on MIDAS flights. Ground data requirements were discussed. The RCA equipment already installed on the base and at the downrange tracking stations was reviewed. Tracking radar personnel were acquainted with the radar beacon characteristics and tolerances required by this program.

e. Modification of AMR Pad 14 is essentially complete without having interfered with pad activity. The missile assembly building is nearing completion and is partially occupied. Checkout and support equipment continues to arrive on schedule.

f. The Site Selection Board, in a meeting at AFBMD, accepted the survey team report against the Thule AFB site and recommended further evaluation of other potential sites for the North Atlantic Station.

5. ARPA ACTION REQUIRED

a. That ARPA approve in principal the requirement for a North Atlantic readout station.

b. That, upon formal AFBMD submission of a detailed proposal for the construction of the necessary R&D elements of a North Atlantic readout facility, ARPA authorize the necessary funding, estimated in previous budget submittals to be in the order of $5.5 millions.

R Curtin for

O. J. RITLAND
Maj Gen, USAF
Commander

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O/R 52

15 September 1959

General Thomas D. White
Chief of Staff
United States Air Force
Washington 25, D. C.

Dear General White:

The gravity of recent decisions placing severe administrative and funding restrictions on the MIDAS development program compels me to bring my views to your personal attention. These restrictions will, with certainty, delay the attainment of an operating system capable of warning the nation of a ballistic missile attack. I regard the problem of adequate warning of a ballistic missile attack as a matter of the greatest national urgency requiring the strongest combined efforts of our military and industrial base to achieve the earliest possible operational capability. The attached memorandum for the Secretary of Defense from Under Secretary of the Air Force MacIntyre, and letters to you from General Power and to the Joint Chiefs from General Partridge fully support this view.

It appears that the best means of detecting ballistic missiles is at the initial stage of their launch, using infra-red equipped satellites. The relative immunity of MIDAS to known countermeasures suggests its joint employment with radar systems in a mutual support role to provide effective and reliable warning and defense for national survival.

There have been many technical evaluations of MIDAS during the past year. The attached reports of two formally constituted ad hoc groups composed of outstanding scientific persons confirm the technical feasibility of the MIDAS development and recommend that it be pursued with the highest priority.

The urgency and importance of achieving national defense requirements and the reasonable certainty of technical feasibility strongly justifies that the concurrent development approach with which you are familiar be followed on the MIDAS program. This method of management requires adequate funding and streamlined administrative procedures at all levels in order that the potential offered by this system will be exploited fully and expeditiously. However, the program is presently inadequately funded to permit concurrent development. The FY '60 estimate to properly fund the program is $109.7 M, yet only $46.9 M has been approved. Even if this deficiency was overcome in FY '61, I estimate that the program will slip about one year behind schedule.

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Recently the Air Staff has expressed the willingness to fund the program as presented by AFBMD to the Air Council and ARPA. There is an understandable reluctance however to accomplish internal Air Force reprogramming for a space development program which is not fully approved by the Defense Department.

With the present Department of Defense and Air Force administrative and management arrangements, it has become virtually impossible to get approval for, and implement, a development plan without experiencing undesirable delays and severe program readjustments. Waste of money and loss of valuable time are the inevitable result.

I strongly recommend, therefore, that you obtain from Dr. York a positive decision to proceed with MIDAS as an operational system in order that the Air Force can continue concurrently with research and development and with the operational support aspects of the program. In this way, we can assure the earliest possible availability of a missile detection and alarm weapon system.

Sincerely,

(signed)

B. A. SCHRIEVER
Lieutenant General, USAF
Commander

5 Incls:
1. Memo Sec'y Def
   12 Feb 59 (S)
2. Ltr to CofS (USAF)
   8 Nov 58(S)
3. Ltr to JCOS
   16 Dec 59(S)
4. Rep ad hoc TAB
   26 Feb 59 (S)
5. Excerpts ad hoc ADS
   15 Jan 59 (S)

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SPACE BELOW [illegible] COMMUNICATION CENTER

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Midas

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ACTION PRIORITY INFO PRIORITY	BOOK	MULTI	SINGLE			
		X		AF	DEF [illegible]14	

FROM: AFBMD (ARDC) LOS ANGELES CALIF

SPECIAL INSTRUCTIONS

TO: COFS USAF WASH DC

INFO: ARDC ANDREWS AFB MD

SECRET FROM WDZSM-10-1-8. HQ USAF FOR GENERAL BOUSHEY, MAJOR DONALD [illegible], AFDAT, COLONEL SIBEX, AFCGM-A, COLONEL MASON, AFCGM, HQ ARDC FOR LT COL HARL, RDZGW. PART I. REFERENCE DEPARTMENT OF DEFENSE MESSAGE DEF 9[illegible]914 TO SECRETARY OF THE AIR FORCE AND WDZSM MESSAGE REPLY WDZSM 9-3-E. THE FOLLOWING LETTER OUTLINE REVIEW OF THE MIDAS DEVELOPMENT PLAN, MAJOR WORK AREAS AND FUND APPORTIONMENT WITHIN FY 60 FUNDS IS SUBMITTED. PART II. GROUND RULES FOLLOWED IN PREPARING THIS ESTIMATE, AND THOSE BEING USED BY [illegible] AND BMD IN PREPARATION OF THE MIDAS WORK STATEMENT, THE DETAILED DEVELOPMENT PLAN AND COSTING INFORMATION ARE AS FOLLOWS: A. TOTAL FY 60 FUNDING FOR THE MIDAS R&D PROGRAM ARE $40.9 MILLION. B. MIDAS LAUNCHES I AND II ARE FIRMLY SCHEDULED FOR JANUARY AND MARCH OF 1960. C. BASIC OBJECTIVES OF THE R&D PROGRAM ARE AS STATED IN ARPA ORDER 38-60, AMENDMENT NO. 7. MAXIMUM EFFORT POSSIBLE WILL BE

DATE 1	TIME	MONTH OCT	YEAR 59

WRITER

SYMBOL WDZSM SIGNED

TYPED NAME AND TITLE (Signature, if required) QUENTIN A. RIEPE, LT COL, USAF/dc

PHONE 2596 | PAGE NR. 1 | NR. OF PAGES 7

SECURITY CLASSIFICATION [redacted]

RELEASER

SIGNATURE SIGNED

TYPED (or stamped) NAME AND TITLE

RICHARD D. CURTIN
Colonel, USAF
Deputy Commander,
Military Space Systems

55

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FROM AFBMD(ARDC) LOS ANGELES CALIF

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TO ATTAIN THESE OBJECTIVES. D. THE MIDAS DOES NOT AT PRESENT HAVE A D-X PRIORITY ON THE MASTER URGENCY LIST, THUS DEFERENCE TO THE SAMOS PROGRAM WILL DETERMINE THE AVAILABILITY OF MIDAS LAUNCH TIME ON COMPLEX I AT ARGUELLO. E. THERE IS CURRENTLY NO APPROVAL OF AN OPERATIONAL MIDAS. THEREFORE, THE DEVELOPMENT PLAN ONLY COVERS THE R&D PROGRAM. LIMITED OPERATIONAL SYSTEM STUDY AND PLANNING IS INCLUDED. F. ADDITIONAL FACILITIES MAY BE REQUESTED AND MUST BE JUSTIFIED ON AN INDIVIDUAL BASIS, AND WILL BE FUNDED SEPARATELY. G. THE PRESENT STATED AIR FORCE REQUIREMENT FOR AN OPERATIONAL SYSTEM IN CALENDAR YEAR 1961 WILL NOT BE MET; AND, THE NEED FOR DECISION TO PROCEED WITH THE CONCURRENT DEVELOPMENT OF AN OPERATIONAL SYSTEM IS DEFERRED. PART III. ON THE BASIS OF THE GROUND RULES OUTLINED IN PART II ABOVE, THE FOLLOWING FLIGHT SCHEDULE IS ESTABLISHED:

FLIGHT I	PAD 14	AMR	JAN 1960
FLIGHT 2	PAD 14	AMR	MAR 1960
FLIGHT 3	COMPLEX 1	PMR	DEC 1960
FLIGHT 4	COMPLEX 1	PMR	MAR 1961
FLIGHT 5	COMPLEX 1	PMR	JUN 1961
FLIGHT 6	COMPLEX 1	PMR	OCT 1961

FLIGHTS SEVEN, EIGHT, NINE AND TEN SCHEDULE DATES ARE CONTINGENT ON THE AVAILABILITY OF ADDITIONAL LAUNCH FACILITIES FOR SPACE PROGRAMS AT OR NEAR VANDENBERG AFB OR POINT ARGUELLO. WITH ADDITIONAL LAUNCH FACILITIES, THE TEN LAUNCH R&D PROGRAM COULD BE

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FROM AFBMD (ARDC) LOS ANGELES CALIF

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COMPLETED BY 1 MAR 62. WITHOUT THE NEW FACILITIES, THE TEN OPERATIONAL LAUNCHERS WOULD STILL BE REQUIRED AT THAT TIME. LAUNCH PROGRAM WOULD BE EXTENDED TO OCTOBER 1962./ PROCUREMENT OF MISSILES FOR FLIGHTS BEYOND FLIGHT SIX HAS NO EFFECT ON THE FY 60 FLIGHT VEHICLE PROCUREMENT PROGRAM. PART IV. FLIGHT CONFIGURATION FOR FLIGHTS ONE THROUGH FIVE ARE AS FOLLOWS: FLIGHTS ONE AND TWO (AGENA 1008 AND 1007) BOOSTER - MODIFIED ATLAS D AIRFRAME, AGENA VEHICLE OF 1000 SERIES, SAME AS THE BASIC DISCOVERER, WITH MODIFIED FORWARD EQUIPMENT, RACK AND AFT BATTERY CONTAINERS. ORBITAL EMPTY WEIGHT, 4325 POUNDS; ORBITAL ALTITUDE, 261 NM; ORBITAL PERIOD, 94 MINUTES; PLANNED ACTIVE LIFE, 23 DAYS. PROPULSION, BELL XLR-81-BA-5, PROPELLANTS, UDMH-IRFNA. AUXILIARY POWER, SILVER PEROXIDE-ZINC PRIMARY BATTERIES. PLUS AN EXPERIMENTAL SOLAR-POWER PHOTOVOLTAIC PANELS AND EXPERIMENTAL SECONDARY NI-CAD BATTERY. GUIDANCE AND CONTROL: BASIC SAMOS SYSTEM. VEHICLE COMMUNICATIONS: PAM/FM VHF DATA LINK, S-BAND TRANSPONDER. ACQUISITION BEACON. VEHICLE TIMER PROGRAMMER, FM/FM TELEMETER WITH TAPE RECORDER DELAYED TRANSMISSION, VHF SOLAR POWERED TELEMETER. PAYLOAD: AEROJET SYSTEM, CONSISTING OF AN INFRARED SCANNER AND COMMAND CIRCUITRY. THE IR SCANNER CONSISTS OF A ROTATING UNIT CAPABLE OF SCANNING 360 DEGREES AT A CONSTANT RATE OF SECTOR SCANNING BY PROGRAM AND/OR COMMAND. COMMAND CHANNELS SELECT AN EXECUTE SECTOR OR FULL SCAN, FILTER CHANGE, TELESCOPE UP OR DOWN, AND TEST SYSTEM. IN THE FILTER OUT CONFIGURATION THE UNIT IS SENSITIVE FROM 1.7 TO 2.8 MICRONS, WITH THE FILTER IN THE BAND IS

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REDUCED TO 2.65 TO 2.8 MICRONS. FLIGHTS THREE, FOUR AND FIVE:

LAUNCH WEIGHT	17,000 POUNDS
ORBIT EMPTY WEIGHT	3,000 POUNDS
ORBITAL ALTITUDE	2,000 NM
ORBITAL PERIOD	168 MINUTES
ACTIVE LIFE	RELIABILITY TEST TO FAILURE.

BOOSTER: ATLAS D, MODIFIED FOR HIGH LAUNCH LOAD. AGENA: 1200 SERIES, DUAL CAPACITY INTEGRAL TANKS. THE ORBITAL ADJUST COMPONENTS WILL BE ADDED FOR AN ORBIT TEST OF THE CONTROL SYSTEM AS EARLY AS POSSIBLE IN THESE THREE FLIGHTS. PROPULSION: BELL AIRCRAFT XLR-81-9 ENGINE WILL BE USED. PROPELLANT UDMH-IRFNA. EXPANSION RATIO INCREASED TO 45 TO ONE. DUAL ULLAGE ROCKETS AND ORBITAL ADJUST COMPONENTS WILL BE ADDED. AUXILIARY POWER: SOLAR POWER WITH SECONDARY BATTERY SYSTEM WILL BE FULLY TESTED DURING THESE FLIGHTS. FLIGHT THREE WILL HAVE BACK-UP PRIMARY BATTERY SYSTEM. CONFIGURATION OF FLIGHTS FOUR AND FIVE WILL BE DETERMINED FROM RESULTS OF FLIGHT THREE. GUIDANCE AND CONTROL: FULLY ACTIVE SYSTEM, MODIFICATION OF THE SAMOS SYSTEM. VEHICLE BORNE COMMUNICATIONS: UHF DATA EQUIPMENT, UHF COMMAND EQUIPMENT, UHF PAM/FM/FM TELEMETRY AND DATA LINK. FLIGHT PAYLOAD: FLIGHT THREE PAYLOAD. BAIRD INFRARED SCANNER CONSISTING OF 175 ELEMENT DETECTOR ARRAY PROVIDING 24 DEGREES FIELD OF VIEW IN THE VERTICAL, 360 DEGREES SCAN IN AZIMUTH AT A RATE OF 36 DEGREES PER SECOND. GROUND COMMANDS WILL PERMIT SELECTION OF FILTER CHANGING SPECTRAL RESPONSE IN THE

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RANGE 2.65 - 2.80 TO 1.80 TO 3.0 MICRONS, ADJUSTMENT OF ELEVATION ANGLE, AND CONTROL OF DETECTOR TEST ILLUMINATION SOURCE. SIX ADDITIONAL DETECTORS, SPECIAL INSTRUMENTED WILL PROVIDE DATA ON WIENER SPECTRUMS AND INFRARED BACKGROUND. A SEPARATE OPTICAL SYSTEM WILL PROVIDE BACKGROUND DATA IN 0.25 AND 4.3 MICRON REGION. FLIGHT FOUR. SAME. FLIGHT FIVE PAYLOAD: FLIGHT TEST OF TWO-COLOR INFRARED SYSTEM. DESIGN AND FABRICATION BASED ON PRINCIPLE OF SCANNING FIELD OF VIEW IN TWO SPECTRAL REGIONS SIMULTANEOUSLY. COMPARISON OF MISSILE ENGINE RADIATION SPECTRA TO BACKGROUND SPECTRA WILL PROVIDE A METHOD OF DISCRIMINATING SMALLER BALLISTIC MISSILES IN THE PRESENCE OF LARGER BACKGROUND RADIATION. SPECIAL CONDITIONS AND PAYLOADS: SUFFICIENT TIME SPAN WILL EXIST ON THE SCHEDULE BETWEEN FLIGHT AND SUFFICIENT FLEXIBILITY IN PAYLOAD CAPACITY TO INCLUDE SPECIAL TESTS AND INSTRUMENTATION IN FOLLOW-ON FLIGHTS BASED ON DATA RECEIVED FROM THE EARLIER FLIGHTS. PART V. R&D PROGRAM CHANGES, PLACE SPECIAL EMPHASIS ON; THE COLLECTION OF SCIENTIFIC AND ENGINEERING DATA TO PROVIDE DESIGN INPUTS INTO THE MIDAS AND POSSIBLE FUTURE FOLLOW-ON IR APPLICATIONS; AND THE ACHIEVEMENT OF THAT RELIABILITY LEVEL IN ALL ELEMENTS OF THE SYSTEM TO ACHIEVE AN ECONOMICALLY FEASIBLE SYSTEM. THREE ADDITIONAL BALLOON FLIGHTS AT OR NEAR 100,000 FEET ALTITUDE WILL BE ACCOMPLISHED AS AN EXTENSION OF PREVIOUS CLOUD BACKGROUND RADIOMETRIC DATA COLLECTED BY THIS MEANS. INVESTIGATIONS WILL INCLUDE SOLAR REFLECTED ENERGY IN THE 2.7 AND 4.3 MICRON SPECTRAL REGION.

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TO AUGMENT THIS EFFORT AND PROVIDE DATA FROM DIVERSIFIED GEOGRAPHICAL LOCATIONS, A U-2 AIRCRAFT WILL BE INSTRUMENTED FOR BACKGROUND MEASUREMENT. FLIGHTS WILL PROVIDE DATA FROM TROPICAL THROUGH ARCTIC GEOGRAPHICAL LOCATIONS. THE RELIABILITY PROGRAM WILL BE FULLY DESCRIBED IN THE DETAILED DEVELOPMENT PLAN. PART VI. FACILITY REQUIREMENTS FOR FLIGHTS ONE AND TWO ARE UNCHANGED. FACILITIES FOR FLIGHT THREE, FOUR AND FIVE WILL INCLUDE: KAENA POINT, HAWAII; VANDENBERG AFB; FORT GREELY, ALASKA; NEW BOSTON, NEW HAMPSHIRE; LAUNCH FACILITIES AT VAFB (ARGUELLO). MAXIMUM USE OF EXISTING EQUIPMENT AND FACILITIES IS PLANNED. PART VII. REALIZATION OF AN EARLY OPERATIONAL CAPABILITY IN MIDAS WILL REQUIRE AN EARLY DECISION TO PROCEED WITH THE CONCURRENT DEVELOPMENT OF; OPERATIONAL EQUIPMENT SUCH AS GSE,, LAUNCH CONTROL EQUIPMENT, READ-OUT AND RELAY STATION, AND TRACKING, COMMAND AND TELEMETRY EQUIPMENT; OPERATIONAL FACILITIES AT THE LAUNCH BASE AND OPERATIONAL STATIONS; AND THE DEVELOPMENT OF AN OPERATIONAL CONCEPT. THE LONGEST LEAD ITEM IS THE LAUNCH BASE FACILITIES. TO REALIZE THE INITIAL LAUNCH OF AN OPERATIONAL NETWORK THE FIRST QUARTER OF CALENDAR YEAR 62, THE DECISION ON THE LAUNCH FACILITIES MUST BE MADE IN DECEMBER 1959. MINIMUM LEAD TIME FOR LAUNCH FACILITIES FROM DECISION THROUGH SITING, DESIGN, SITE ADAPTATION, CONSTRUCTION, INSTALLATION AND CHECK OUT IS 26 MONTHS. DECISIONS ON FAR NORTH AND UNITED KINGDOM STATIONS WILL BE REQUIRED FIRST QUARTER OF CALENDAR YEAR 60. PART VIII. AS PRESENTED TO ARPA ON 24 JULY 1959, PHASES I AND II

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WOULD HAVE REQUIRED $60.1 MILLIONS IN FY 60. THE APPROVED FUNDING IS $46.9 MILLIONS WHICH REPRESENTS A CUT OF $13.2 MILLIONS. THE SCHEDULE CHANGES DESCRIBED ABOVE WILL APPARENTLY AFFECT THE NECESSARY FY 60 COST REDUCTIONS AS FOLLOWS: IN-PROCESS BOOSTER HARDWARE AND LAUNCH COSTS WILL BE REDUCED FROM $15.1 MILLIONS TO $6.8 MILLIONS FOR A REDUCTION OF $8.3 MILLIONS, AND IN-PROCESS AGENA HARDWARE AND LAUNCH COSTS WILL BE REDUCED BY $6.9 MILLIONS. SUBJECT TO REFINEMENT UPON RECEIPT OF DEFINITIVE PRICE PROPOSAL, THE REVISED FY 60 PROGRAM WILL TENTATIVELY CONSIST OF:

LOCKHEED	$ 38.1 M
BOOSTERS	$ 6.3 M
MISC	$ 2.0 M
	$ 46.9 M

ANALYSIS OF CONTRACTOR PROPOSED DEVELOPMENT PLANS, NEGOTIATION OF WORK STATEMENTS, AND COSTING INFORMATION MAY CAUSE MODIFICATIONS TO BOTH SCHEDULING AS PROPOSED AND COSTING WITHIN THE FUND LIMITATIONS. PRESENT SCHEDULE OF THESE ACTIVITIES IS: NEGOTIATION OF WORK STATEMENT, 5-8 OCT; COSTING OF WORK STATEMENT, 8 OCT - 1 NOV; DEVELOPMENT PLAN SUBMITTAL, 15 NOV.

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WDZSN	7	7	[redacted]	WDZSN 59	

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ADVANCED RESEARCH PROJECTS AGENCY
WASHINGTON 25, D. C.

ARPA Order No. 38-60
Amendment No. 9
Project Code No. 6100

October 20, 1959 Date

TO: Commander
Air Research and Development Command
Andrews Air Force Base
Washington 25, D. C.

ARPA Order No. 38, dated November 5, 1958, as amended, is hereby further amended to decrease the fund availability by $1,750,000 from $42,550,000 to a new total of $40,800,000 under appropriation and account symbol "97X0113.002 Salaries and Expenses, Advanced Research Projects Agency, Department of Defense." This decrease is made to stay within funds presently available to ARPA for this project. Additional funding for MIDAS will be made available when $28.9 million is transferred from the Air Force.

for Roy W. Johnson
Director

Copy to: Secretary of the Air Force

cc: WDGE (orig)
WDZ
WDZF
WDZS.
LBF
WDCB
WDPPS (orig)
WDPPI
WDP (orig)

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TO RJWZBK/AFBMD ARDC INGLEWOOD CALIF
INFO RJEZFF/ARDC ANDREWS AFB MD
DA GRNC
BT

UNCLAS DEF443636 FROM OSD ARPA SGD JOHNSON

AMENDMENT NO. 9, DATED OCTOBER 20, 1959, TO ARPA ORDER NO. 38, REDUCES THE FUND AVAILABILITY BY $1,750,000 TO A NEW TOTAL OF $40,800,000. THIS DECREASE IS THE RESULT OF BRINGING THE MIDAS FUNDS IN LINE WITH THOSE PRESENTLY AVAILABLE TO ARPA FOR TPS PROJECT. ADDIITIONAL FUNDING FG MIDAS AMUST AWAIT RECIPT OF $28.9 MILLION FROM THE AIR FORCE.

BT
CFN DEF443636 9 20 1959 38 $1,750,000 $40,800,000 $28.9
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AIR FORCE [redacted] DIVISION
HEADQUARTERS
AIR RESEARCH AND DEVELOPMENT COMMAND
UNITED STATES AIR FORCE
Air Force Unit Post Office, Los Angeles 45, California

REPLY TO
ATTN OF: WDPCR

SUBJECT: MIDAS Program Progress Report

9 November 1959

TO: Director
Advanced Research Projects Agency
Washington 25, DC

1. This report covers progress during the month of October 1959 in the MIDAS Program, directed by ARPA Order 38 (Project Code No. 3600). Prime contractor is Lockheed Missile and Space Division. ARPA funding for fiscal year 1959 was $22.8 millions. The presently approved ARPA funding level for fiscal year 1960 is $46.9 millions. A summary list of contractors is given in Tab 3, Section I of the Development Plan. As a result of the August 1959 message directive from ARPA, a joint LMSD/AFBMD/BMC MIDAS Program reorientation conference was convened on 26 August. In accordance with ARPA instructions, the program was redefined into R&D and operational phases. Lockheed was instructed to prepare a new contractors' development plan and cost proposal to be available for review approximately 15 October 1959. A new work statement is being prepared. Program planning and funding directives have been issued to Lockheed to permit continuation of the program.

2. TECHNICAL STATUS

a. The first MIDAS flight test vehicle was hot fired successfully in Stand No. 1 at Santa Cruz Test Base on 23 October. Flight date has been rescheduled tentatively for February 1960. Modification and check-out of the second flight test vehicle is 65 percent complete. Work stoppages on third and subsequent flight vehicles during the recent program reorientation have been lifted. Work on these units is progressing in accordance with the new schedules and the reoriented configurations. Components and subsystems from three vehicles deleted from the MIDAS program will be transferred to DISCOVERER follow-on flights, or to SAMOS flights.

b. Design criteria decisions for the solar auxiliary power equipment for the third flight have been made. The array will consist of two wings, totaling approximately 126 square feet, with each wing operating as a totally independent system. The wings will be mechanically fixed until released by ground command or in response to low battery voltage. Launch conditions were agreed upon to provide maximum operation of the solar units.

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Cy No. 32 of 54 Cys.

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c. At a meeting at the Ballistic Missile Early Warning System Project Office in New York City on 30 September, representatives of LMSD, IBM, RCA, Western Electric, Mitre Corporation, and defense agencies ADSID, BMEWS, NORAD, ARDC, ADC, Hq USAF, and SAC, discussed the integration possibilities of the MIDAS and BMEWS efforts. It was established that BMEWS forward sites were not capable of using raw MIDAS data. It was agreed that MIDAS could use the BMEWS communications routing. The feasibility of providing using agencies with integrated MIDAS BMEWS data displays was discussed, but decision was deferred pending further study. The sharing of forward site locations was considered impractical because of electronic environment interference considerations.

d. The MIDAS reliability program has been expanded to include: (1) a system simplification review, including operational and hardware requirements, (2) a schematic survey, including a review of design standards and parts applications, (3) a component replacement study to determine components to be replaced immediately to improve reliability, (4) component life-testing under normal laboratory conditions with more sophisticated testing to follow later, (5) investigation of ABLE-3 components flight life data for checking against MIDAS component reliability predictions, and (6) an investigation of further flight vehicle instrumentation to obtain long life data on certain selected items. The ARINC Corporation reliability report has been received and is undergoing study and evaluation.

e. Three operational type ground presentation unit proposals have been received and are being evaluated. It is intended that these units be used for later development flights and evaluated at that time for operational capability.

f. Animated motion pictures of simulated MIDAS operational visual situation display are planned to aid in obtaining optimum clarity and maximum information capabilities in basic design criteria. The pictures will be a tool for engineering and human engineering development of display characteristics. A wide variety of information is to be presented. Present studies include arrangement of the data, what sector under surveillance should be presented, type of map presentation, color and shape coding, and terrestrial characteristics to be included.

3. PROBLEMS ENCOUNTERED

First analysis of an LMSD cost estimate for the reoriented MIDAS program verifies the preliminary opinion reported last month that funding and reoriented program objectives are not compatible. Analysis will be completed and determination made as to the best course of action to follow to remain within funding limits. The present schedule calls for completing this analysis and incorporating it into a Development Plan for submittal to Hq USAF by 23 November.

4. WORK SCHEDULES

a. The second airborne Aerojet-General scanner unit and the second Aerojet-General ground presentation unit were delivered to LMSD, and will be subjected to compatibility testing. The third scanner unit was received by LMSD on 26 October. One scanner unit remains to be delivered.

b. Tracking and Data Acquisition station construction is progressing as follows:

(1) North Pacific Station, Alaska. All foundation work for the technical facilities at Donnelly Flats has been completed. The administration and data acquisition building and the power plant have been enclosed. Construction operations were closed down as of 1 November for the winter and will resume on or before 1 April. Completion of the various facilities is scheduled on an incremental basis between June and October 1960. All work is currently on schedule.

(2) North Atlantic Station. Studies are being continued to locate a suitable site for this station.

(3) East Atlantic Station, United Kingdom. The field survey for this site was completed on 1 October. Seven sites were surveyed, of which six appear acceptable from the standpoint of electronic interference level. RAF stations Edzell and Kirkbride are the two preferred sites. Kirkbride is the superior facilities site, however, the possibility of sharing facilities with the US Navy exists at Edzell. Further study has been ordered to determine whether both the Air Force and Navy missions can be accommodated at Edzell.

(4) Vandenberg Air Force Base. Construction of the tracking and data acquisition building is progressing on schedule. The MIDAS addition is currently being advertised for construction bids, with completion scheduled for April 1960. Design criteria have been completed for the GE MOD III Guidance facility. Design will begin in November. Beneficial occupancy date is October 1960.

(5) New Boston. Construction of this tracking and data acquisition station is progressing on schedule with completion scheduled on an incremental basis from February to September 1960.

(6) Ottumwa, Iowa. Plans and specifications for the technical facilities for this tracking and data acquisition station are complete and ready for contract advertising. Design of support facilities is being initiated. Construction is to begin in December 1959, with completion scheduled for February 1961.

(7) Development Control Center, Sunnyvale, California. Construction of increment one is progressing on schedule, toward completion in December. Increment two is being advertised for construction bids, with completion scheduled for June 1960.

5. **ARPA ACTION REQUIRED**

No ARPA action is required at this time.

Harry L. Evans
for O. J. RITLAND
Major General, USAF
Commander

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See attached Distribution

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☒ ACTION REQUESTED ☒ CHANGE ☐ SIGNIFICANT EVENT ☐ RESULTS

MANAGEMENT REPORT

☒ SYSTEM ☐ PROJECT ☐ TASK ☐ ENGINEERING SERVICE

REPORTS CONTROL SYMBOL: [illegible]-RDD(A) 119

PAGE 1 OF 1

DATE: 13 November 1959

TITLE: (U) ADVANCED RECONNAISSANCE SYSTEM

NUMBER: 117L

RESPONSIBLE AGENCY: [illegible]

USING COMMAND: AFBMD

PARTICIPATING CENTERS:

PROGRAM STRUCTURE: 117L

PARTICIPATING/COORDINATING/INTERESTED COMMANDS: ARDA, AMC, SAC, USN, ADC, TAC, AAC, PACAF, AFCS

TECHNICAL GROUP: AT

APPLICABLE AREAS:
- a. ☐ TECHNICAL
- b. ☐ TEST
- c. ☐ FUNDS
- d. ☐ MATERIEL
- e. ☐ FACILITIES
- f. ☐ MANPOWER
- g. ☐ PERSONNEL
- h. ☐ TRAINING
- i. ☐ CONTRACTS
- j. ☐ AIRCRAFT

REMARKS:

This report terminates the documentation of Projects 1755 through 1764 and Projects [illegible], formerly reported under 117L. Future documentation will be part of SAMOS (117M), MIDAS (239A), and DISCOVERER (117L) Development Plans.

✓

11 JAN 1960

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TO COMAFBMD ARDC
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UNCLAS FROM RDZGV-11-18-E. FOR WDGE, COL HAMILTON;
WDZ, COL CURTIN; WDFC, LT COL GETZ. FOLLOWING ATTACHMENT 1
TO ARPA ORDER NO 38-59 IS QUOTED FOR YOUR INFORMATION AND
NECESSARY ACTION: QUOTE

PREPARATION OF REPORTS

1. MONTHLY PROGRESS REPORT.

THIS REPORT WILL BE SUBMITTED IN TWO PARTS, A NARRATIVE SECTION AND A MILESTONE PROGRESS SECTION.

NARRATIVE SECTION. A LETTER REPORT WILL BE PREPARED EACH MONTH BY THE ADDRESSEE OF THE ABOVE NUMBERED ARPA ORDER, GIVING A NARRATIVE ACCOUNT OF WORK PERFORMED UNDER THE ORDER. THE INITIAL REPORT WILL COVER THE FIRST CALENDAR MONTH FOLLOWING THE DATE OF THIS ORDER. SUBSEQUENT REPORTS WILL COVER WORK PERFORMED DURING EACH MONTH THERE AFTER. THE REPORT WILL BE SUBMITTED IN QUADRUPLICATE TO THE DIRECTOR, ADVANCED RESEARCH PROJECTS AGENCY, AND IS DUE WITHIN 10 DAYS FOLLWOING THE CLOSE OF THE MONTH REPORTED. THE ARPA ORDER NUMBER AND SUBJECT OF THE PROJECT SHOULD BE STATED IN THE HEADING OF EACH REPORT.

THE REPORT WILL BE IN LETTER FORM AND GENERALLY NOT EXCEED THREE PAGES IN LENGTH. IT WILL PRESENT A NARRATIVE SUMMARY OF WORK PERFORMED INCLUDING TECHNICAL STATUS, MAJOR ACCOMPLISHMENTS, PROBLEMS ENCOUNTERED FUTURE PLANS, AND ANY ACTION REQUIRED BY ARPA. THE INITIAL REPORT SHOULD INCLUDE AN INTRODUCTORY PREFACE OUTLINING THE BACKGROUND, OBJECTIVES, AND ASSIGNMENT OF RESPONSIBILITY FOR THE PROJECT. ALL REPORTS SHOULD INCLUDE PHOTOGRAPHS AND ILLUSTRATIONS AS APPROPRIATE. IN ADDITION AN AUTOPOSITIVE NEGATIVE (KODALITH MASTER) FOR EACH ILLUSTRATION SHOULD BE INCLUDED, WHERE PRACTICAL, FOR USE IN PRESENTATIONS OR REPRODUCTIONS.

MILESTONE PROGRESS SECTION. INSTRUCTIONS FOR PREPARATION OF THIS SECTION, WHICH REQUIRES USE OF A STANDARD FORMAT IN REPORTING ACTUAL PROGRESS AGAINST PLANNED PROGRESS IN ACCOMPLISHING A MAJOR MILESTONES, WILL BE ISSUED AT A LATER DATE.

11. SEMI-ANNUAL TECHNICAL SUMMARY REPORT.

A TECHNICAL SUMMARY REPORT WILL BE PREPARED SEMI-ANNUALLY FOR PERIODS ENDING JUNE 30 AND DECEMBER 31 OF EACH YEAR. THE REPORT WILL PRESENT A CONCISE AND FACTUAL DISCUSSION OF TECHNICAL FINDINGS AND ACCOMPLISHMENTS DURING THE QUARTER. THE INITIAL TECHNICAL SUMMARY REPORT WILL COVER A PERIOD OF AT LEAST 3 MONTHS SUBSEQUENT TO ISSUANCE OF A CONTRACT OR WORK ORDER; OTHERWISE, THE REPORT SHOULD BE DELAYED UNTIL CLOSE OF THE NEXT 6 MONTH PERIOD. THE REPORT WILL BE SUBMITTED IN QUADRUPLICATE TO THE DIRECTOR, ADVANCED RESEARCH PROJECTS AGENCY, AND IS DUE WITHIN 30 DAYS FOLLOWING THE CLOSE OF THE REPORT PERIOD. ADDITIONAL DISTRIBUTION MAY BE SPECIFIED BY ARPA AT A FUTURE DATE. THE ARPA ORDER NUMBER AND SUBJECT OF THE PROJECT SHOULD BE STATED IN THE HEADING OF EACH REPORT.

UNQUOTE.

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THE SECRETARY OF [illegible]
WASHINGTON

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MEMORANDUM FOR THE SECRETARY OF THE AIR FORCE

SUBJECT: [illegible] of MIDAS Program [illegible] Department of the [illegible] Force

[illegible] for further [illegible] 59, subject as above.

[illegible] with the [illegible] referenced [illegible] of program [illegible] for MIDAS from the [illegible] Projects Agency [illegible] Department of the Air Force [illegible]

[illegible] that the program [illegible] conducted essentially [illegible] approval of an Air Force [illegible] be submitted to the [illegible] of Defense Research [illegible] 12 January [illegible] that the revised [illegible] reliability to ensure [illegible] useful operational [illegible] phase be [illegible] office.

[illegible] referenced memorandum, [illegible] 1960, an operational [illegible] relationships.

[illegible] to arrange for the [illegible] FY 61 funds.

[illegible]
DEPUTY

DOWNGRADED AT [illegible] YEAR
INTERVALS; NOT AUTOMATICALLY
DECLASSIFIED. DOD DIR 5200.10

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ADVANCED RESEARCH PROJECTS AGENCY
WASHINGTON 25, D.C.

ARPA Order No. 38-60, 5 nov 58
Amendment No. 10
Project Code No. 6100

December 3, 1959 Date

TO: Commander
Air Research and Development Command
Andrews Air Force Base
Washington 25, D. C.

In accordance with the Secretary of Defense memorandum dated November 17, 1959, responsibility for the work covered by ARPA Order No. 38, as amended, is hereby released to the Secretary of the Air Force.

Title to equipment and facilities procured under this Order is hereby transferred to the Department of the Air Force.

The Secretary of the Air Force will supply to ARPA a quarterly progress report for the quarter ending December 31, 1959, as final fulfillment of the reporting requirements under this Order.

FY 1960 funds available for this project are being transferred to the Air Force by OASD Comptroller action.

Funds available on this Order under appropriation and account symbol "97X0113.002 Salaries and Expenses, Advanced Research Projects Agency, Department of Defense" are hereby reduced by $18,000,000 from $40,800,000 to a new total of $22,800,000. Any costs pertaining to the work covered by this Order in excess of funds remaining on this Order shall be chargeable to Air Force accounts and are not in any way chargeable to ARPA.

Don R. Ostrander
Don R. Ostrander
Maj. Gen., USAF
Acting Director

Copy to: Secretary of the Air Force

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30DEC 59 WDZE

S E C R E T DPL 5919. SUBJECT: (U) SAMOS AND MIDAS PROGRAMS. THIS MESSAGE IN 7 PARTS. PART I: REFERENCE IS MADE TO HQ SAC MESSAGE TO ARDC, CITE VC-5541, DATED 16 DEC 59, WHICH RECOMMENDED THAT ARDC AND SAC JOINTLY RE-EXAMINE THE SAMOS AND MIDAS PROGRAMS IN ORDER TO RETAIN AN OPERATIONAL CAPABILITY OR BE IN A MORE DEFINITIVE POSITION TO RE-OPEN THE CASE FOR ADDITIONAL MONIES. PART II: REFERENCE IS MADE TO HQ USAF MESSAGE TO ARDC, CITE AFDAT 98212, DATED 21 DEC 59, WHICH REQUESTED ARDC TO ADVISE USAF ASAP AS TO THE EARLIEST DATE THAT AFBMD

DOWNGRADED AT 12 YEAR INTERVALS: NOT AUTOMATICALLY DECLASSIFIED. DOD DIR. 5200.10

PAGE TWO RJWZBK 261

CAN BRIEF THE AIR STAFF FOR PURPOSES OF POSSIBLE INTERNAL REPROGRAMMING TO INCREASE PRESENTLY AVAILABLE FUNDS PRIOR TO NEXT AFBMC MEETING ON THESE PROGRAMS. PART III: SUBSEQUENT TO THE ABOVE TWO MESSAGES, HQ SAC HAS RECEIVED A MESSAGE FROM GENERAL LEMAY WHICH READS AS FOLLOWS: "TECHNICAL ORIENTATION OF THE SAMOS AND MIDAS DEVELOPMENT IS BEING DIRECTED BY THE AFBMC IN ORDER TO ATTAIN A BASIS FOR FLIGHT TEST PROGRAMS WITHIN PRESENT FY 1960 AND 1961 FUND CEILINGS OF THE AIR FORCE. REQUIREMENTS IN EXCESS OF FUND CEILINGS WILL BE PRESENTED IN ORDER OF PRIORITY AND THE AIR STAFF WILL EXAMINE THE POSSIBILITY OF FINANCING AFBMC APPROVED ITEMS BY REPROGRAMMING FROM WITHIN CURRENTLY LIMITED RESOURCES. FINANCING APPROVED REQUIREMENTS IN EXCESS OF FUND CEILINGS WILL NECESSITATE ADJUSTMENT OF WEAPON SYSTEMS CONTAINED IN PRESENT PROGRAMS. RECOMMEND YOUR COMMAND SUBMIT ANY RECOMMENDATIONS FOR REDUCTION OR DELETION OF TASKS FROM WITHIN THE SAMOS AND MIDAS PROGRAMS OR FROM WEAPON SYSTEMS WHICH YOU CONSIDER OF A LESSER PRIORITY THAN SAMOS AND MIDAS." PART IV: IN VIEW OF THE ABOVE, IT FOLLOWS THAT

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SAC AND ARDC SHOULD JOINTLY AGREE ON THE PRESENTATION TO BE MADE TO THE BMC PRIOR TO ITS PRESENTATION TO EITHER THE AIR STAFF OR THE BMC. PART V: THE BASIC SAC POSITION IS THAT ANY THOUGHT OF FURTHER SLIPPING SAMOS AND MIDAS IS INCONCEIVABLE IN LIGHT OF THE REQUIREMENT FOR WARNING GENERATED BY THE MISSILE THREAT. THEREFORE, THE AIR STAFF SHOULD PROVIDE THE MONIES REQUIRED TO OBTAIN AN OPERATIONAL SAMOS PROGRAM ON 1 JULY 1962 AND AN OPERATIONAL MIDAS PROGRAM ON 1 JAN 63, EVEN AT THE EXPENSE OF OTHER PROGRAMS. PART VI: IN ORDER TO TRY AND SALVAGE A USEABLE OPERATIONAL PROGRAM WITHIN CURRENT CEILINGS, IT IS RECOMMENDED THAT SAC AND ARDC JOINTLY EXAMINE AS SOON AS POSSIBLE, THE MONEARY SAVIMGS ASSOCIATED WITH THE FOLLOWING SAC RECOMMENDATIONS: KA) PAYLOADS. NO CHANGE TO E-2 AND E-5 SCHEDULE. DELETE ONE (1) F-1 AND THREE (3) F-2 SHOTS. CONTINUE F-3 AS PLANNED: (B) T/A SITES. THREE (3) ARE REQUIRED; VAFB, OTTUMWA AND NEW BOSTON; (C) 2 LAUNCH PADS ONLY ON PT ARGUELLO WITH SUBSEQUENT USE OF 65-1 FOR OPEATIONAL SAMOS/MIDAS LAUNCHINGS; KD) STC. RESTRICT FACILITIES AND EQUIPMENT TO MINIMUM ESSENTIAL FOR SAMOS AND MIDAS PROGRAMS ONLY. POSSIBILITY OF LOCATING COMPUTER IN INCREMENT I SHOULD BE EXAMINED. INCREMENT II AND III PLANS AND EQUIPMENT SHOULD BE DEFERRED UNTIL FY 62. (E) MANUALS. DEVELOP HIGH QUALITY PRODUCT CLASS I MANUALS TO PRECLUDE LATER DUPLICATION OF CONTENT AND SCOPE BETWEEN CLASS I AND CLASS III MANUALS. (F) SOC. NO SLIPPAGE FROM PREVIOUSLY ESTABLISHED SCHEDULE. (G) ORBITAL ADJUST. ORBITAL ADJUST DEVELOPMENT PROGRAM SHOULD BE RETAINED IN ORDER TO PRECLUDE EXCESSICE REQUIREMENTS FOR SATELLITE PAYLOADS DURING OPERATIONAL PHASE. (H) MOD III GUIDANCE. THIS REQUIREMENT SHOULD BE DELETED IN ITS ENTIRETY OR AT LEAST DEFERRED UNTIL FY 62. (I) GSE. ALL GSE SHOULD BE REVIEWED FOR LOSSIBLE REDUCTION IN SOPHISITICATION, SCOPE AND REDUNDANCY. (J) FORMAL USAF TRAINING. SHOULD BE RETAINED BUT RESTRICTED TO MINIMUM ESSENTIAL FACTORY AND ON-SITE TRAINING. (K) OPERATIONAL LOGISTICS PLANNING-SHOULD BE RETAINED. '1) MAB. DELETE REQUIREMENT TO MODIFY A SAC MAB AND AESOCIATED GSE FOR THE OPERATIONAL SAMOS

PAGE FIVE RJWXBR 261
PROGRAM. IN LIEU OF THIS, THE OPERATIONAL PROGRAMS
WOULD USE THE CURRENT WS-117L HAB AND GSE. (M) T/A
STATIONS. ELIMINATE SOPHISTICATION THROUGH STANDARDIZATION
OF ITEMS, SUCH AS COMPUTERS THROUGHOUT THE WEAPON
SYSTEMS. (N) DENVER FAC
LITY. EXAMINE PRODUCT IMPROVEMENT PROGRAM, FOR SAMOS AND MIDAS, AT THE DENVER FACILITY
THIS PROGRAM SHOULD BE TERMINATED AS SOON AS THE DPF
BECOMES FUNCTIONAL AT OFFUTT AFB. PART VII: WITH
REGARDS TO PART VI ABOVE, IT IS REQUESTED THAT ARDC
ESTABL
SH A MEETING TIME AND PLACE AS SOON AS POSSIBLE,
BUT NOT LATER THAN 13 JAN 60, TO DEVELOP A JOINT SAC-
ARDC RECOMMENDATION TO THE AIR STAFF AND AFBMC.
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ENCRYPTION—PHYSICALLY RE-
MOVE ALL INTERNAL REFERENCES BY DATE-TIME
GROUP PRIOR TO DECLASSIFICATION."

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PRIORITY

X AF

COMDR AFBMD LOS ANGELES CALIF.

COMDR 6594TH TEST WING (SATELLITE) SUNNYVALE, CALIF.

COMDR 6555TH TEST WING, PATRICK AFB, FLA.

CHIEF AFBMD FLD OFC VANDENBERG AFB, CALIF.

CONFIDENTIAL FROM [illegible] WDZYM-1-11-E

FOR 6594 TW, ATTN: COL MOORE. FOR 6555 TW, ATTN: COL KICKEL.

FOR VAFB, ATTN: COL COOK (WDGSV).

THIS IS A PERSONAL MESSAGE FROM GENERAL RITLAND TO COL MOORE, COL KICKEL, AND COL COOK. ~~SUBJECT:~~ "TEST OPERATIONS CONTROL POLICY AND RESPONSIBILITIES FOR MIDAS FLIGHTS FROM AMR".

1. REFERENCES: A. MIDAS DETAILED TEST OBJECTIVES (LMSD) 437437 DATED 5 OCT 59. B. MIDAS [illegible] SUPPORT REQUIREMENTS (LMSD) 423000-3. C. FLIGHT TEST RESPONSIBILITIES, PROCEDURES & ORGANIZATION AT AFMTC (MIDAS) DATED 27 JUL 59. D. 6594TH TEST WING COMMUNICATIONS SOP DATED 7 DEC 59. E. LETTER FROM 6594TH TW (S) SUBJ: MIDAS TEST RESPONSIBILITIES DATED 5 JAN 60.

JAN 1 6 1960

WDGSM 14 JAN 60

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SIGNED

O. J. RITLAND
MAJOR GENERAL, USAF
COMMANDER

WDGZT

ALFRED H. ALLRED, MAJOR, USAF/bms

~~CONFIDENTIAL~~

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AFBMD LOSA CALIF

PAGE TWO

2. THIS MESSAGE IS INTENDED TO CLEARLY DEFINE THE RESPONSIBILITIES OF EACH OF YOUR ORGANIZATIONS, IN CONDUCTING THE TWO MIDAS FLIGHTS FROM AMR AND IS FORWARDED ~~IN LIEU~~ PRIOR TO the PUBLICATION OF A SYSTEM TEST CONTROL PLAN.

3. HEADQUARTERS AFBMD, AS REPRESENTED BY THE MIDAS PROGRAM OFFICE HAS THE DIRECT RESPONSIBILITY FOR THE ACCOMPLISHMENT OF ALL PHASES OF THE MIDAS R&D PROGRAM. THIS RESPONSIBILITY INCLUDES THE OVER-ALL MANAGEMENT OF THE WEAPON SYSTEM CONTRACTOR BY CONTRACTUAL ACTION THROUGH THE BMC AS WELL AS BY ~~DIRECT~~ TECHNICAL, PROGRAMMING AND TEST ~~OPERATIONAL~~ GUIDANCE AS DIRECTED THROUGH THE MEDIUM OF THE DTO AND ANY CHANGES THERETO, WHICH IS APPROVED BY WDZYM.

4. MIDAS TEST OPERATIONS AND SUPPORT INCLUDING COMMUNICATIONS PROCEDURES ARE DEFINED IN THE REFERENCED AFBMD APPROVED DOCUMENTS. ANY DEVIATIONS ~~FROM THESE PROCEDURES~~ WHICH A EFFECT THE ACCOMPLISHMENT OF THE PROGRAM AND TEST OBJECTIVES ARE SUBJECT TO FINAL AFBMD APPROVAL UPON THE RECOMMENDATION OF THE CONTRACTOR AND THE MILITARY ORGANIZATIONS CONCERNED.

5. THE 6594TH TW (S) IS ASSIGNED THE RESPONSIBILITY FOR THE OVER-ALL CONDUCT OF THE MIDAS SYSTEM TEST OPERATIONS IN ACCORDANCE WITH Referenced ~~APPROPRIATE~~ DOCUMENTS AS APPROVED BY HQ AFBMD. THE 6594TH TW (S) WILL EXERCISE THEIR RESPONSIBILITIES THROUGH (A) THE CONTRACTORS' ORGANIZATIONS; And (B) 6555TH TW (D). 6594TH TW (S) RESPONSIBILITIES INCLUDE THE FOLLOWING:

1) SYSTEM TEST OPERATIONS CONTROL FROM START OF SYSTEM COUNTDOWN THROUGH ACTIVE ORBIT LIFE.

WDZYM 174

~~CONFIDENTIAL~~

2) OPERATION OF THE SATELLITE TEST CENTER.

3) ESTABLISHMENT OF SYSTEM TEST SOP'S INTEGRATING THE ACTIVITIES OF THE 6594TH TW (S) AND THE 6555TH TW (D). THIS TO BE ACCOMPLISHED WITH THE COOPERATION OF THE 6555TH.

4) ASSIGNMENT OF TRACKING, COMMAND, ORBITAL CONTROL AND READOUT FUNCTIONS.

5) CHAIR THE SYSTEM TEST WORKING GROUP.

6) EVALUATE SYSTEM TEST OPERATIONS AND RECOMMEND IMPROVEMENTS.

7) PREPARE A SYSTEM TEST DIRECTIVE TO COVER THE ORBITAL PHASE OF THE MIDAS VEHICLE.

6. THE 6555TH TW (D) IS RESPONSIBLE TO THE 6594TH TW (S) FOR THE CONDUCT OF THE MIDAS LAUNCH, ASCENT AND ORBIT INJECTION PHASES OF THE SYSTEM TEST OPERATIONS. THIS WILL BE ACCOMPLISHED THROUGH THE CONTRACTOR'S ORGANIZATION, COMMAND CONTROL OF ASSIGNED MILITARY ORGANIZATIONS, COORDINATION WITH THE AMR AS NECESSARY, AND UNDER THE TEST OPERATIONAL CONTROL OF THE 6594TH TW (S) AS PERTAINS TO OVER-ALL SYSTEM TEST CONTROL AND READINESS. THE 6555TH TW (D) IS ALSO ASSIGNED THE RESPONSIBILITY TO CONDUCT ORBITAL TRACKING AND DATA READOUT OPERATIONS UNDER THE TEST OPERATIONAL CONTROL OF THE 6594TH TW (S) AND AS OUTLINED IN THE MIDAS SYSTEM TEST DIRECTIVE LMSD 445989. THE 6555TH TW (D) RESPONSIBILITIES INCLUDE THE FOLLOWING:

123

1) CONDUCT THE LAUNCH COUNTDOWN, LAUNCH AND ORBIT INJECTION PHASE OF THE TEST.

2) OPERATE THE HANGAR E CONTROL CENTER.

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3) ESTABLISH NECESSARY LOCAL SOP'S.

4) PARTICIPATE IN PREPARATION OF APPROPRIATE SYSTEM SOP'S.

5) CHAIR FLIGHT TEST WORKING GROUP.

6) EVALUATE LAUNCH OPERATIONS AND RECOMMEND IMPROVEMENTS.

7) PREPARE A FLIGHT TEST DIRECTIVE TO COVER THE LAUNCH OPERATIONS PHASE OF THE TEST.

7. THE VAFB FIELD OFFICE IS ASSIGNED THE RESPONSIBILITY TO CONDUCT ORBITAL TRACKING, COMMAND AND DATA READOUT OPERATIONS UNDER THE OPERATIONAL CONTROL OF THE 6594TH TW (S) AND AS OUTLINED IN THE MIDAS SYSTEM TEST DIRECTIVE LMSD 445909.

8. I WOULD LIKE TO MEET WITH THE COMMANDERS OF THE ADDRESSEE ORGANIZATIONS AT AFBMD DURING THE WEEK OF 8 FEBRUARY 1960. AT THAT TIME I WOULD LIKE TO ASSURE YOUR UNDERSTANDING OF THE ABOVE; AND I WOULD LIKE TO DISCUSS WITH YOU THE IMPORTANCE OF THIS FIRST SPACE SYSTEM TEST AND ITS IMPLICATIONS FOR THE FUTURE OF THE AIR FORCE.

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//CLASS CONFIDENTIAL//FROM AFDAT 64965
REFERENCE AFDAT MESSAGE 98212, 21 DECEMBER. IN ADDITION TO RECOMMENDATINS FOR MIDAS IN ACCORDANCE WITH ACTIONS DIRECTED IN AFDAT 98212, IT IS REQUESTED THAT ARDC BE PREPARED TO DISCUSS A PROGRAM THAT WOULD INSURE THE EARLIEST POSSIBLE OPERATIONAL DATE FOR MIDAS ASSUMING 1 MARCH 1960 GO AHEAD.
BT
22/1958Z JAN RJEZHQ

"A—PARAPHRASE NOT REQUIRED EXCEPT PRIOR TO CATEGORY B ENCRYPTION—PHYSICALLY REMOVE ALL INTERNAL REFERENCES BY DATE-TIME GROUP PRIOR TO DECLASSIFICATION."

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see msg AFDAT 98212
in volume
SH[illegible]

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MIDAS I FACT SHEET

1st launch 26 Feb 60

HOLD FOR RELEASE
UNTIL LAUNCH

I. GENERAL INFORMATION

PROJECT MIDAS (Missile Defense Alarm System) is a research and development project designed to test the feasibility of providing a missile defense alarm system to give early warning of a ballistic missile attack. A number of MIDAS research satellite firings will be conducted into both the Atlantic Missile Range and the Pacific Missile Range.

Responsibility for PROJECT MIDAS was transferred from the Advanced Research Projects Agency of the Department of Defense to the Air Force on November 17, 1959. The program is being executed by the Air Force Ballistic Missile Division.

MIDAS employs the AGENA satellite vehicle which is boosted into orbit by an Air Force ATLAS booster. The AGENA is also used in PROJECT DISCOVERER.

The MIDAS program is designed to detect heat radiation from the exhaust plumes of ballistic missiles and to feed detections into the Air Defense warning net. This passive defense system can provide improved means for defense against hostile ballistic missiles by increasing the warning time to approximately thirty minutes.

II. CONFIGURATION

First Stage (booster)

Standard Air Force ATLAS modified to accommodate MIDAS I.

Height (with adapter section) - approximately 77 feet

Launch Weight - approximately 260,000 pounds

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Propulsion - Following coast period after ATLAS burnout, Bell liquid fuel rocket engine developing 15,000 pound thrust will propel second stage into orbit.

Guidance and Control - The ATLAS booster is equipped with the General Electric/Burroughs radio command guidance system. The guidance system can detect missile position and rate, compare this information with predetermined trajectory data and commands the flight correction to guide the missile.

Satellite Vehicle

The entire Lockheed AGENA second stage becomes the orbiting satellite vehicle.

Height - Approximately 22 feet

Diameter - Approximately 5 feet

III. TEST OBJECTIVES

The primary objectives of the first MIDAS flight are to establish the workability of the ATLAS/AGENA combination, the launch procedures and the tracking and communications system.

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HEADQUARTERS
AIR FORCE BALLISTIC MISSILE DIVISION (ARDC)
UNITED STATES AIR FORCE
Air Force Unit Post Office, Los Angeles 45, California

MAR 31 1960

REPLY TO ATTN OF: WDZYM/LtCol Riepe/3071

SUBJECT: MIDAS Launches Between April 1960 and December 1960

TO: LBZJ

1. AFDAT has directed ARDC to investigate the feasibility of launching a MIDAS test during the period of April - December 1960. This problem has been thoroughly studied and is ready for presentation to Headquarters USAF. The date for the presentation has been postponed from 24 march to 31 March. However, it is felt that this interval of time should be used to prepare planning and perform that engineering necessary to be ready to expedite the implementation of MIDAS 2.5 launches on the following basis.

a. THOR/AGENA B of the DISCOVERER 1102, 1103 series.

b. Flown in the DISCOVERER configuration with MIDAS Aerojet General IR scanner 1 and 3.

c. Launches from Arguello Complex 75-1, Pad 1 or 2.

d. GSE, launch control equipment, and hangar equipment currently at AFMTC in Hangar E and on Pad 14 be transferred to VAFB for the MIDAS 2.5 launch.

e. The Douglas Thor configuration of 75-1, Pad 1 or 2 be placed in the configuration of Pad 4 and 5. X

f. Modifications to the THOR, AGENA and the launcher umbilical be made to permit launch on a nominal azimuth of 172 degrees.

g. Flight objectives to be limited to the collection of IR data and those development objectives that are pertinent to the MIDAS program.

8 2. Those planning and engineering activities to be conducted between now and an approval with funding from USAF should include:

a. Identification and disposition schedule for that equipments now located at Patrick AFB Hangar E and installed on Pad 14 that are to be shipped, the shipping instructions, modification instructions, ultimate installation location and the installation and check out schedule.

b. Identify and perform preliminary engineering on this equipment so that the total scope of the work to be accomplished can be

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Date JAN 17 1962

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readily undertaken upon program approval.

c. Identify and perform preliminary engineering on the 1102/1103 category of DISCOVERER vehicles necessary for them to be used in the MIDAS 2.5 mission.

d. Identify and perform preliminary engineering on the Aerojet MIDAS scanners one and three necessary to make them suitable for flight on the vehicles 1102 and 1103.

e. Initiate with Douglas Aircraft in conjunction with Lockheed the identification of that work which must be accomplished on Pad 75-1 in order to make it suitable for the launch of the THOR/AGENA B vehicle on a launch azimuth of 172 degrees. This includes the umbilical mast extension and modification as dictated by the orientation of the pads on Complex 75-1.

X

f. Within Douglas Aircraft in conjunction with LMSD identify and perform preliminary engineering necessary to modify the existing THOR/AGENA B vehicle to permit launch from the existing 75-1 orientation into the 172 degree exit azimuth.

g. Identify the work schedules between Douglas and Lockheed for the installation and checkout, vehicle modifications, launch readiness, and launch of the THOR/AGENA B/MIDAS 2.5 vehicle.

3. The above efforts to not include the actual undertaking of engineering modifications, procurement of materials or equipment. Approval of this phase of the MIDAS 2.5 launches is contingent upon USAF approval and funding to conduct the program.

4. It is requested that this preliminary action be initiated at the earliest possible date with both Lockheed and Douglas Aircraft. Lockheed's planning efforts may be conducted on the existing MIDAS contract. The work to be accomplished by Douglas may be conducted on the existing Douglas contract with funds to be provided by the MIDAS Program for this study work.

5. Paragraph 1 can be used as the guidelines in this request. Paragraph 2 is to be implemented as soon as possible. Request MIDAS Program Office be notified of the total cost involved with particular emphasis on Paragraph 4.

DONALD L. PHELPS
Lt. Colonel, USAF
Executive Officer
Space Systems

FREDERIC C. E. ODER
Colonel, USAF
Assistant Deputy Commander
Space Systems

Seen by WDZNA, 1 April 60
Major USAF

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LBZSP/V. L. Smith/2936 1 April 1960

Budget Estimate for Preliminary Engineering and
Planning Effort for MIDAS Launches

CCNF-1

Douglas Aircraft Company, Inc.
Attn: Mr. J. G. Berry
3000 Ocean Park Blvd.
Santa Monica, California

1. AFDAT has directed ARDC to investigate the feasibility of launching a MIDAS test during the period of April - December 1960. This problem has been thoroughly studied and is ready for presentation to Headquarters USAF. The date for the presentation has been postponed from 24 March to 31 March. However, it is felt that this interval of time should be used to prepare planning and perform that engineering necessary to be ready to expedite the implementation of MIDAS 2.5 launches on the following basis:

a. THOR/AGENA B of the DISCOVERER 1102, 1103 series.

b. Flown in the DISCOVERER configuration with MIDAS Aerojet General IR scanner 1 and 3.

c. Launches from Arguello Complex 75-1, Pad 1 or 2.

d. GSE, launch control equipment, and hangar equipment currently at AFMTC in Hangar E and on Pad 14 be transferred to VAFB for the MIDAS 2.5 launch.

e. The Douglas Thor configuration of 75-1, Pad 1 or 2 be placed in the configuration of Pad 4 and 5.

f. Modifications to the THOR, AGENA and the launcher umbilical be made to permit launch on a nominal azimuth of 172 degrees.

g. Flight objectives to be limited to the collection of IR data and those development objectives that are pertinent to the MIDAS program.

2. Pursuant to the above, it is requested that Douglas Aircraft Company furnish this office (LBZSP) a budget figure for accomplishing the Preliminary Engineering and Planning effort applicable to the Douglas Aircraft Company as outlined in paragraph 3 below.

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3. Those planning and engineering activities to be conducted between now and an approval with funding from USAF should include:

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By Authority of MSC Guide for Midas Programs
By Date JAN 1 7 1962

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a. Identification and disposition schedule for that equipments now located at Patrick AFB Hangar E and installed on Pad 14 that are to be shipped, the shipping instructions, modification instructions, ultimate installation location and the installation and check out schedule.

b. Identify and perform preliminary engineering on this equipment so that the total scope of the work to be accomplished can be readily undertaken upon program approval.

d. Identify and perform preliminary engineering on the 1102/1103 category of DISCOVERER vehicles necessary for them to be used in the MIDAS 2.5 mission.

d. Identify and perform preliminary engineering on the Aerojet MIDAS scanners one and three necessary to make them suitable for flight on the vehicles 1102 and 1103.

e. Initiate with Douglas Aircraft in conjunction with Lockheed the identification of that work which must be accomplished on Pad 75-1 in order to make it suitable for the launch of the THOR/AGENA B vehicle on a launch azimuth of 172 degrees. This includes the umbilical mast extension and modification as dictated by the orientation of the pads on Complex 75-1.

f. Within Douglas Aircraft in conjunction with LMSD identify and perform preliminary engineering necessary to modify the existing THOR/AGENA B vehicle to permit launch from the existing 75-1 orientation into the 172 degree exit azimuth.

g. Identify the work schedules between Douglas and Lockheed for the installation and checkout, vehicle modifications, launch readiness, and launch of the THOR/AGENA B/MIDAS 2.5 vehicle.

The above efforts do not include the actual undertaking of engineering modifications, procurement of materials or equipment. Approval of this phase of the MIDAS 2.5 launches is contingent upon USAF approval and funding to conduct the program.

4. Your earliest possible reply is requested.

Joseph Zakas, Jr.

JOSEPH ZAKAS, JR.
Major, USAF
Chief, Special Projects Div.

(3)

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By Authority of MSC Guide for Midas Programs
By [illegible] Date JAN 1 7 1962

Smith

CCN ~~classified CONFIDENTIAL~~ Unclassified --
agreeable with WDZNA office
per telecon between Lt Col
Marcus (WDZNA) and Mr. Smith
(LBZSP) 6 April 1960.

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WDGX/Col Soper/607

AFBMC Review of the Midas Program 23 June 60

MEMO FOR RECORD

1. In a telecon this afternoon, Gen Greer advised that he had been specifically directed by Dr. Perkins to inform AFBMD that key members of subject Committee (as a result of today's review of the Midas program presented by Cols Oder and Riepe) are seriously concerned with the continued lack of contractual diversification in the expanding Air Force space programs. In this respect, continued augmentations of the LMSD effort is viewed askance and is subject to valid criticism when considered in relation to the various and sundry incidents, mishaps, poor performances, etc., attributable to LMSD deficiencies in recent months. Specifically, the Committee considers it advisable that the two additional Midas shots planned to include radiometric devices be so implemented as to provide that the radiometers be obtained from other than LMSD. Such action would be a first step in implementing a policy of diversifying the contractual base of the space programs.

2. Gen Greer intimated that until the AFBMC is provided assurance of steps in the direction as indicated above, approval action on the Midas program might be held in abeyance. In this regard, Dr. Perkins will visit here next week (28 June). He will desire further discussions on this matter at that time. Following his visit here, he will proceed to LMSD for a further look-see into Lockheed programs. It is understood that Secretary Sharp has expressed personal concern to Mr. Root regarding Lockheed's efforts and that Dr. Perkins' visit there on the 29th is a follow-up to this expression of concern.

SIGNED

RAY E. SOPER
Colonel, USAF
Executive Officer

cy to: Gen Terhune
Col Evans

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23 Feb 61

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FM HQ USAF WASH DC
TO GJEZFF/ARDC ANDREWS AFB MD
INFO RJWZBK/AFBMD LOSA CALIF
BT

67th meeting

/S E C R E T/FROM AFDSD-MS 88479
ARDC FOR RDRBS AND AFBMD FOR WDZYM. THE FOLLOWING DIRECTION BY THE AIR FORCE BALLISTIC MISSILES AND SPACE COMMITTEE IS FURNISHED FOR NECESSARY ACTION (A) THAT THE MIDAS DEVELOPMENT PLAN BE REVISED IN ACCORDANCE WITH A RDT&E PROGRAM LEVEL OF $106.8 MILLION IN FY 61 AND 201.0 MILLION IN FY 62. (B) NO ACTIONS WILL BE TAKEN ON FUNDS ASSOCIATED WITH THE TCC IN THE AMOUNT OF $0.9 MILLION FOR FY 61 AND $11.6 MILLION FOR FY 62 AND P-300 FUNDS IN THE AMOUNT OF $8.5 MILLION FOR FY 61. THIS SUBJECT WILL BE RECONSIDERED AFTER A SUCCESSFUL SERIES II FLIGHT IS ACCOMPLISHED. (C) PROVIDE THE COMMITTEE WITH DETAILED JUSTIFICATION OF THE LOCKHEED REQUIREMENT FOR AN ADDITIONAL $2 MILLION RDT&E FUNDS FOR INDUSTRIAL FACILITIES.
BT
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I-1218

news 70

July 19, 1961

The following is the verbatim text of a statement made in the British Parliament this morning:

"Her Majesty's government and the government of the United States of America have agreed to establish a ground readout station of the Missile Defence Alarm System, MIDAS. This will be situated at the Royal Air Force Station, Kirkbride in Cumberland. The text of the agreement is available as a White Paper in the vote office.

"MIDAS is now under development by the United States government. It will consist of a number of space satellites equipped with infrared apparatus to detect ballistic missiles in the early stages of their flight. Information recorded in the satellites will be relayed back to readout stations, one of which will be at Kirkbride. This information will complement that provided by the ballistic missile early warning radar system. It will give even earlier warning than the BMEWS system; and will make it even more difficult for an enemy to launch a successful surprise attack on western strategic deterrent forces. Our contribution to this new system will thus be of direct value to the Royal Air Force, the United States Air Force and the forces of our other NATO allies.

"Kirkbride will be commanded and operated by the Royal Air Force. Warning information from MIDAS will be available simultaneously to operations centers in the United Kingdom, the United States and to the Supreme Allied Commander, Europe.

"The United States will provide and install the special equipment for the station and the communications required to link it with the United States. The United States will also defray in the first instance, the cost of the technical works services required to make the station operational. The United Kingdom will repay these costs within an agreed limit, after the station becomes operational.

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON 25, D. C.

FORQ

SOR No. 239

Date 28 January 1964

(S) SPECIFIC OPERATIONAL REQUIREMENT FOR A MISSILE DEFENSE ALARM SYSTEM

This SOR supersedes that portion of SOR 80 (revised) dated 28 September 1958 that pertains to the Missile Defense Alarm System (Program 461) and cancels SOR Addendum 80-3, dated 26 September 1958 and Amendment 80-3A dated 9 February 1959.

PURPOSE: This SOR documents the requirement for a satellite-borne, ballistic missile attack warning and surveillance system, to be developed under Program 461. A limited operational capability is required as soon as practicable to detect ballistic missiles launched from Soviet regions, for the purpose of investigating in detail and without incurring additional investment costs, the operational application of a satellite-borne missile defense alarm system. The expected results of this limited effort will be to: (1) develop and deploy operational prototype vehicles which incorporate the latest advances in the technology emerging from the continuing development program; (2) provide, within the limits of sophistication and coverage, additional early warning capabilities complementary to other existing and programmed ballistic missile warning systems; (3) derive data for determining the optimum fully operational system; (4) acquire technical intelligence on foreign missile and space activities.

Concurrently, a continuing research and development effort will be directed toward eventual realization of the full operational capability to detect all types of surface or aerospace launched missiles, consistent with the false alarm rate specified herein. During development, and when fully operational, the system will provide a network of satellites and ground facilities capable of detecting ballistic missile and space launches and reporting acquired data within specified limits of time and accuracy.

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1. OPERATIONAL MISSION. The operational mission of the system is to detect and report surface and aerospace launched ballistic missiles at the earliest point during the launch phase.

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PROGRAM 461

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2. ENEMY EFFECTIVENESS ESTIMATES. Enemy capabilities are contained in the current SOR Intelligence Annex.

3. FRIENDLY ENVIRONMENT. The system is envisioned to be largely self-sufficient, but some dependence upon existing facilities for support will be required as follows:

a. Launch Facilities. Existing and planned national range facilities will be used during the development of and for the fully operational system as far as possible. Additional launch facilities may be required to support the fully operational system.

b. Communications. USAF global point-to-point communications will support the initial operational capability where possible. The fully operational system will utilize CONUS communications to transmit data from the U. S. readout station(s) to system users.

c. User Display. System status and satellite data will be provided to and displayed by authorized users as required.

d. Compatibility. The system will be designed for maximum compatibility with other related systems such as BMEWS, global reconnaissance and intelligence, without degrading its primary role.

4. CONCEPT OF OPERATION AND SUPPORT.

a. General. The system will provide the earliest tactical warning of a ballistic missile or space launch by detecting and reporting such launches during the launch phase. As an essential element of the NORAD early warning complex, this system will complement the several systems which comprise the Aerospace Surveillance and Warning System (ASAWS).

b. Employment. Satellite-borne sensors will be employed to produce ultimately a fully operational system with the capability to:

(1) Ensure substantially continuous surveillance of the areas from which a ballistic missile attack or space launch may emanate.

(2) Provide maximum reaction time for U. S. military forces and civil agencies.

(3) Acquire technical intelligence data on foreign missile launchings.

(4) Contribute to the support of U. S. research and development operations.

c. System Phasing. Program 461 is a research and development program which will ultimately result in a fully operational system. Throughout the development phase, a limited operational capability will be maintained to provide additional warning capabilities and to investigate the operational employment concepts based on advances in technology derived from the research and development program.

d. System Configuration and Operation.

(1) The objective of the initial operational capability will be to maintain a minimum of two operative satellites in orbit continuously. Observations will be transmitted to existing readout stations, and relayed via the most expeditious communications routes to the NORAD COC and other using agencies.

(2) The fully operational system will be designed to provide the most economical configuration of satellites and ground elements to ensure substantially continuous global coverage of probable launch areas. Observations will be transmitted via an intersatellite communications system to CONUS readout station(s), and relayed via the most expeditious communications channels to the system users.

e. Command and Control. The Joint Chiefs of Staff have assigned the operational satellite surveillance system to CINCONAD for operational command, and to CINCNORAD for operational control. The Air Defense Command is designated the using command and will be responsible for the unilateral function of the fully operational system as required by CINCONAD/NORAD.

f. Manpower and Organization.

(1) Design, organization and utilization of the system will give full consideration to conservation of the limited manpower resources and skills required for efficient operation and maintenance of the system.

(2) Contractual support for operation and maintenance may be provided as required during development and operation of the system.

(3) Except for commercially leased facilities, the fully operational system will be operated and maintained by Air Force personnel.

(4) Manpower requirements for the fully operational system will be developed and submitted in accordance with AFR 375-4, and will specify separate requirements for the acquisition, operation and support of the system.

g. Personnel.

(1) Design, organization and utilization of the system will stress simplicity and reliability of equipment, and economy in personnel requirements.

(2) The System Program Director will identify and detail those personnel elements which will be developed in support of the fully operational system. The Personnel Subsystem Team in the SPO will identify and direct the personnel subsystem milestones to be developed in support of this system. The time phasing of these selected elements will be correlated with the overall development program.

(3) Previously developed Qualitative and Quantitative Personnel Requirements Information (QQPRI) from this general type of system will be used if and as required. QQPRI effort will not be duplicated to produce data currently available within the Service establishment. Training actions will be revised to reflect changes contained in this SOR.

(4) The detailing of the various elements of the Personnel Subsystem will be accomplished through maximum in-service effort wherever possible, consistent with availability of qualified personnel, and in accordance with AFR 30-8.

(5) Testing and evaluation of the PSS for the fully operational system will be in accordance with AFR 80-14 and AFR 30-8. QQPRI for the system, or any part thereof, will be developed in accordance with Mil-D-26239A.

h. Training.

(1) Development of all training programs in support of the fully operational system, exclusive of unit training and the determination of equipments necessary to support these training programs, will be the responsibility of Air Training Command (ATC).

(2) ATC will prepare initial documentation to reflect the above training function and associated elements thereof. This representative documentation will be included in the Proposed System Package Plan (PSPP) as designated and specified in AFR 375-4.

i. Commercially available components modified to approved military specifications will be employed.

j. Materiel Support - Initial Operational Capability.

(1) Spares and spare parts support during the RDT&E phase of system acquisition will be the responsibility of the contractor. Maximum use will be made of AFLC long supply assets. Detailed objectives and relationships of the acquisition phase to the operational phase will be outlined in Section 6 of the PSPP/SPP.

(2) The System Program Director will assure that AFLC and the using command are provided a listing of system equipment items as a basis for preparation of the Equipment Component Lists (ECL), and the Equipment Authorization and Inventory Data (EAID). Section 8 of the PSPP/SPP will outline follow-on spare parts support for the operational phase.

(3) Maximum use of Air Force standard and common items will be made during RDT&E in accordance with paragraph 9 of AFR 67-19.

k. Materiel Support - Fully Operational System.

(1) Supply support will be from an aggregation of stocks in a Weapon System Storage Site and, therefore, would insure prompt support of the system and establish a single point of contact between the user and AFLC.

(2) Provisioning will be conducted with maximum reliance on consumption data developed by the contractor during RDT&E.

(3) The System Support Manager (SSM) will serve as the logistics advisor to the system program office (SPO) in support of the System Program Director on all logistics matters pertaining to the system. The SSM will also serve as the internal AFLC focal point for all elements or actions in the Program 461 System for which AFLC is functionally responsible during the acquisition and operational phases of this system.

l. Maintenance.

(1) Organizational, field and depot level maintenance will be employed for support of the fully operational system. Adherence to the policy of "base self-sufficiency" and maximum maintenance at the lowest level possible is required. The using command will accomplish organizational and field level maintenance. Depot level maintenance will be the responsibility of the Air Force Logistics Command (AFLC). The provisions of AFR 66-1, AFR 66-17, AFR 66-18, AFM 66-1, and AFM 65-1[illegible] will apply.

(2) Technical orders will be maintenance oriented. Cost, quantity, and elaborateness will be kept to an absolute minimum. Technical orders will be prepared, numbered, and distributed in the same format, system, and procedures as is the current Air Force Technical Order system, AFR 66-7.

m. Maintainability.

(1) This system will be designed to meet its operational objectives with a minimum expenditure of maintenance resources. The cost of achieving maintainability will be recognized as inherent in the overall cost for the delivery of an operationally effective system. Mil-M-26512B and the appropriate appendix(ces) will be applied to the fully operational system in accordance with AFR 66-29 and AFR 375-4.

(2) Aerospace ground equipment (AGE) design and level of automation will be justified by use of the operational analysis techniques. For the fully operational system, Mil-D-9412D for AGE will apply.

(3) Quantitative maintainability of objectives will be included in the maintainability program in accordance with DOD Instruction 3200.6, AFR 66-29, AFR 375-4, and Mil-M-26512B.

n. Reliability.

(1) Reliability for the space based components is defined as the mean-time-to-failure interval which minimizes total cost by selection of the optimal combination of high reliability design versus the alternative of more frequent replacement launches.

(2) Reliability of all segments of the fully operational system will be governed by the provisions of AFR 80-4.

o. Testing Status Classification. Air Defense Command will perform the operational testing and evaluation for the fully operational system as required by AFR 80-14, and will participate in status classification. Status classification will be in accordance with AFR 80-6, and will be initiated on those items designated by the System Program Director on a schedule to support operational requirements.

p. Center. The requirements for an operation center are defined in SOR 181 (NORAD COC). The NORAD COC will become the focal point for operational command and control of the fully operational system.

q. Communciations. This SOR does not require the establishment of a new and complete communications network. However, where there are additional communications required, they will be compatible with the USAF Aerospace Communications Complex and other elements of the Defense Communications System.

r. Data Processing. Existing or planned data processing facilities, such as those associated with NORAD COC and ASAWS will be used where possible in processing and distributing information generated by Program 461. Duplication of data processing facilities will be held to a minimum.

s. Safety. The Proposed System Package Plan (PSPP) and the System Package Plan (SPP) will include a system safety plan applicable to the acquisition and operational phases. Mil-S-38130 will be applied to this system.

5. LIMITATION OF PRESENT SYSTEMS. This warning and surveillance system will complement and extend the capabilities of existing systems as follows:

a. Ballistic Missile Early Warning System (BMEWS):

(1) Warning Time: The fully operational system will extend the present warning time available from BMEWS of ballistic missile attack from Soviet areas. During development, the system also will extend existing warning time, consistent with its coverage capability.

(2) Coverage: The fully operational system will detect missiles fired to avoid existing BMEWS coverage. During development, partial coverage against omni-directional threats will exist.

SPECIAL ACCESS REQUIRED
PROGRAM 461

(3) Credibility of Warning: By observing phenomena fundamentally different from those observed by other systems, the system will complement and verify any warning received from BMEWS both during the development and when fully operational.

(4) Vulnerability: During development and when fully operational, the system will be less vulnerable to either electronic jamming or physical attack than is BMEWS, owing to the complexity of the jamming power transmission problem and the difficulty of accurately targeting satellites. The vulnerability of the fully operational system can be further reduced by achieving higher operating altitudes, redundancy through numbers of operational and decoy satellites, and inter-satellite communications which will reduce dependency upon ground readout facilities outside the CONUS.

(5) Launch Locations: The fully operational system will locate the areas from which ballistic missiles have been launched to within 2-4 nautical miles (NM). This location data, presently not provided by other missile warning systems, will contribute to achieving the capability to retarget residual enemy strike forces.

(6) Global Coverage: The fully operational system will provide worldwide surveillance of missile launchings to complement the limited BMEWS coverage of Soviet areas. During development, the system will provide incremental surveillance within the limitations of its coverage.

b. Sea Launched Ballistic Missile (SLBM) Warning. Program 461 will complement an SLBM warning system in approximately the same manner as described for BMEWS above.

6. OPERATIONAL PERFORMANCE.

a. General.

(1) An initial operational capability will be exercised as practicable throughout the development cycle. The objective will be to maintain at least two satellites in orbit simultaneously. However, a lesser capability will be acceptable in the interests of economy in operation. In any event, satellite parameters and ground facilities will be employed to achieve maximum geographic coverage of probable Soviet launch areas, without incurring additional investment costs.

(2) The fully operational system will be configured to provide substantially continuous, worldwide surveillance of missile launchings.

b. System Capabilities.

(1) The initial operational capability shall provide:

(a) A minimum capability to detect in real time infra-red radiations from surface launched intercontinental ballistic missiles of the liquid fueled type currently in the Soviet inventory.

(b) Location of sites from which missiles have been launched to within an 8-12 NM radius.

(c) Maximum of five false target track indications in any five-minute period, occurring with a frequency not to exceed once per year.

(d) A minimum raid detection capacity of 200 simultaneous launches.

(2) The fully operational system shall provide:

(a) A minimum capability to detect radiations from all types of surface or aerospace launched missiles with a probability of not less than 99% for any single launch, and consistent with the false alarm rate specified below.

(b) Location of individual sites from which missiles have been launched to within a 2-4 NM radius.

(c) Maximum of two false target track indications in any five-minute period, occurring with a frequency not to exceed once per year.

(d) A minimum raid detection capacity of 200 simultaneous launches.

c. Satellite Vehicle. During development and when fully operational, the vehicles shall be of sufficient size to house sensors, power supply, telemetry and auxiliary equipment. In-orbit mean-time-to-failure of the fully operational satellite and equipment combined shall be established at the time interval which minimizes total cost by selection of the optimal combination of high reliability design versus the alternative of more frequent replacement launches.

d. Communications.

(1) Communications supporting the initial operational capability

for transmission of desired sensor data to the NORAD CCC not more than two minutes after initial detection, shall be provided.

(2) Communications supporting the fully operational system shall provide real time transmission of selected sensor data to the NORAD CCC. An inter-satellite communications system will be employed to achieve this capability, and to reduce dependence upon ground communications facilities outside the CONUS.

e. Data Processing. Sufficient data processing will be provided to permit automatic technical control, calibration, maintenance and evaluation of the system's operation. Launch observations and system status will be automatically forwarded to NORAD CCC for evaluation of missile attack warning. Data processing shall provide sufficient capacity for processing a minimum of 200 simultaneous launch indications.

7. GENERAL CONSIDERATIONS.

a. Management. Program management will be in consonance with the Air Force Series 375 Regulations.

b. Documentation. The Proposed System Package Plan (PSPP) and the System Package Plan (SPP) will indicate a time-phased system acquisition schedule with associated funding.

8. SPECIAL CONSIDERATIONS.

a. Growth Potential.

(1) Design will permit maximum incorporation of growth features made possible by integration of new technological advances.

(2) Specific areas in which growth may be expected are:

(a) Increased detection capability and coverage for the sensor subsystem.

(b) Increased ability to detect various sizes and types of ballistic missile and space vehicle launchings.

(c) Refinements in resolution of launch point locations.

(d) Improved track capability.

(e) Discrimination techniques.

(f) ECCM techniques.

(g) Detection and identification of atmospheric/space nuclear explosions.

(h) Detection using other regions of the electromagnetic spectrum.

(3) The above growth requirements are to be considered as follow-on goals for the fully operational system, and should not impede the establishment of an initial operational capability.

b. Automatic False Alarm Check. An automatic false alarm check should be incorporated to preclude spurious signals from alerting the system.

c. Information Check. An automatic check of information transmitted is required.

d. Documentation Changes. The requirements for follow-on capabilities demonstrated through research and development will be incorporated in this SOR by amendment or revision.

9. AVAILABILITY. The initial operational capability is required as soon as practicable. Full operational capabilities are required by 1970.

William W Momyer

WILLIAM W. MOMYER
Major General, USAF
Director of Operational Requirements
DCS/Programs and Requirements

SPECIAL ACCESS REQUIRED
PROGRAM 461

~~CONFIDENTIAL~~ [redacted]

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HEADQUARTERS UNITED STATES AIR FORCE
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AFRDDF

DD-No. 46

5 MAY 1965

DEVELOPMENT DIRECTIVE
For
Program 461

I. PROGRAM IDENTITY. (S) This Directive is applicable to Program Element 6.34.09.89.4. This Directive implements Technical Development Plan for Program 461, dated 15 May 1964, as modified by paragraphs III and IV herein. The system capabilities cited in Specific Operational Requirement No. 209, for a Missile Detection Alarm System, dated 28 January 1964, remain valid as goals for Program 461.

II. IMPORTANCE CATEGORY. (U) Importance Category I is reaffirmed.

III. FUNDING STATEMENT. (C) The approved current fiscal year (FY 65) and future years funding is as follows:

(millions of dollars)

	FY 65	FY 66	FY 67	FY 68	FY 69	FY 70
RDT&E	26.9	39.5	80.0	50.0	20.0	-
MIL CONST	-	.5	.3	-	-	-
TOTAL	26.9	40.0	80.3	50.0	20.0	-

$26.9 million FY 65 funding has been authorized and released to Hq AFSC by PA's No. 1, dated 1 July 1964 and No. 50, dated 30 October 1964 and BA's No. 1, dated July 1964 and No. 24, dated 2 Nov 1964. ARPA Order 102-31, dated 5 January 1965, transferred an additional $1.2 million, FY 65 funds for integration of VELA experiments into Program 461. D&F No. 65-11c-3, dated 12 August 1964 applies.

IV. GENERAL GUIDANCE.

A. (S) Technical Development Plan for Program 461, dated 15 May 1964, is approved except as follows:

1. Funding shall be as indicated in paragraph III above.

2. Development Test Series (DTS-I) orbital test vehicles shall be eliminated.

3. The planned physical research, background measurements, experimental and study programs essential to the selection and configuration of the RTS-II vehicle (system) design shall be continued.

See [illegible]

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~~SECRET~~ 17 Feb 1965 13

Extracted from
PTDP for Program 266,
15 Nov 65

SECTION 13

AUTHORIZATIONS

13.0 INTRODUCTION.

(U) This section identifies significant documents that constitute authority and direction for the 266 Program. It also includes the proposed Determinations and Findings (D&F).

13.1 SPECIFIC OPERATIONAL REQUIREMENT - 209

(U) The SOR-209, dated 28 January 1964, (S-SAR), Attachment 13-1 herein, was published but not fully directed. Subsequent correspondence indicated that the SOR was to serve as a guidance document only.

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13.2 HQ AFSC MESSAGE.

(S) Hq AFSC unclassified message, MSFU 14325, dated 17 February 1965, to SSUM at Hq SSD, is quoted below:

> "This msg in five parts. Part I. Request personnel of the SSD/Aerospace 461 Program Offices visit this Hqs on 24 Feb 65. Purpose of visit will be to review in detail the proposed RFP for studies to configure the next series of launches past the RTS-I. Part II. As discussed during 8-11 Feb 65 the studies must be, repeat, must be system studies with minimum constraints. The program objectives remain as stated in the 15 Jan 64 DDR&E memo and in the Program 461 TDP dated 15 May 1964. Part III. It is expected that selected study contractors will include trade-offs to arrive at their recommended system and that they will provide cost estimates for their recommended system excluding items that could be GFE. Part IV. Studies should be completed by about mid-September 1965 and are to be used by SSD/Aerospace to configure the next series of launches beyond RTS-I. Part V. Further direction will be given after this RFP review and will include results of the briefings given to USAF and DDR&E on 9-11 Feb 65".

EXCLUDED FROM AUTOMATIC
REGRADING; DOD DIR 5200.10
DOES NOT APPLY

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PCP to accompany PTDP. The PCP will be submitted during the normal FY-67 and FY-68 Budget Cycle. It also indicated that program priority was the same as for Program 461.

13.7 DETERMINATION AND FINDINGS (D&F).

(U) A copy of the D&F Study, unclassified, and the proposed D&F, unclassified, are included herein as Attachment 13-3.

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LIST OF MIDAS LAUNCHES

Launch	Date	Launch Site	Configuration	Results
MIDAS I	2/26/60	ETR	Atlas 29D, Agena 1008. Experimental IR Scanner Payload	Failed to achieve orbit.
MIDAS II	5/24/60	ETR	Atlas 45D, Agena 1007. Experimental IR Scanner Payload	262 n.mi. circular orbit achieved. Limited IR data obtained.
DRM-1	12/20/60	WTR	Discoverer XIX (Thor-Agena). Radiometric Payload to investigate background in 2.7 and 4.3 micron bands.	Obtained useful data in both bands.
DRM-2	2/18/61	WTR	Discoverer XXI (Thor-Agena). Radiometric Payload to investigate and confirm background in 2.7 and 4.3 micron regions.	All data channels functioned properly. Valid data obtained on 6 stable orbits.
MIDAS III	7/21/61	WTR	ETS II Atlas 97D, Agena 1201. Experimental set, for 600 kw/ster targets at 2.7 microns: 8 high-resolution radiometric channels; UV and 4.3 micron non-scanning radiometers.	Orbit achieved. Solar array power failure on 5th orbit.
MIDAS IV	10/21/61	WTR	ETS II Atlas 105D, Agena 1202. Experimental set, for 600 kw/ster targets at 2.7 microns; 8 high-resolution radiometric channels.	Orbit achieved. Loss of payload data after orbit 50 due to solar array cycling beyond design limits.

TABLE 6.0.1-1 - Summary of Previous Flight Tests

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Launch	Date	Launch Site	Configuration	Results
MIDAS V	4/9/62	WTR	ETS-II Atlas 110D, Agena 1203. Experimental set, for 600 kw/ster targets at 2.7 microns; 8 high-resolution radiometric channels; UV and 4.3 micron non-scanning radiometers also flown	Orbit achieved. Loss of payload data after orbit 7 due to disabled telemetry command function.
DRM-3	8/28/62	WTR	Discover XLIL (Thor-Agena 1153); Program 162 flight with DRM-3 riding "piggyback". Radiometric payload to measure IR background in 2.65 to 2.80 micron region.	Data obtained on 42 orbits, but limited to real-time periods over tracking stations due to failure of tape recorder.
DRM-4	9/62	WTR	Discover (Thor-Agena 1154); Program 162 flight with DRM-4 riding "piggyback". Radiometric payload to measure IR background in 2.65 to 2.80 micron region.	Successful flight. World-wide IR background measurements obtained.
Aerospace 4-Color	12/14/62	WTR	Discoverer LVIII Thor-Agena Experimental Payload; 1.4, 1.8, 2.2 and 2.7 micron bands.	Successful flight. Worldwide IR backgrounds obtained.
Program 461 Flight VI	12/17/62	WTR	ETR-III Atlas 13D, Agena 1205. Experimental Payload for 300 kw/ster targets.	Booster failure on ascent.

TABLE 6.0.1-1 - Summary of Previous Flight Tests (Continued)

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Launch	Date	Launch Site	Configuration	Results
Program 461 Flight VII	5/9/63	WTR	ETS-III Atlas 119D, Agena 1206. Experimental payload for 300 kw/ster targets.	Successful 47-day flight, obtaining over 10^{10} data points. Exceeded design specifications by detecting all cooperative launches in field of view. Failure occurred as predicted when solar array power decreased below critical level due to seasonal shift of orbit plane.
Program 461 Flight VIII	6/12/63	WTR	ETR-III LV-3, Atlas 139D, Agena 1204. Experimental payload for 300 kw/ster targets with radiometric background measurement capability.	Booster failure on ascent.
Program 461 Flight IX	7/18/63	WTR	ETS-III Atlas 75D, Agena 1207. Experimental payload for 300 kw/ster targets, with radiometric background measurement capability.	All primary objectives were attained including substantial quantities of background data and target detection data. Satellite vehicle performed satisfactorily until 97th orbit, when there was a loss of AC power and satellite stability.
PB5 RM-5	11/9/63	WTR	Discoverer (Thor-Agena 1171): Program 162 flight with RM-5 riding "piggyback". Radiometric payload to investigate IR background at multiple scattering angles on the 2.75 to 2.80 micron region.	Failure occurred in the booster approximately two minutes after lift-off, causing the flight test to be terminated. No radiometric data were required.

TABLE 6.0.1-1 - Summary of Previous Flight Tests (Continued)

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Launch	Date	Launch Site	Configuration	Results
RM-104	2/25/65	WTR	Program 241 (Thor-Agena 1611) 0.28, 1.8, 2.2, 2.7, and 2.8 micron multicolor IR and UV comparative experiment.	Functioned normally. Useful data obtained; some sensitivity loss in the IR channel.
RM-12 RM-15, & TV Camera	9/2/65	WTR	Program ~~251~~ 241 (Thor-Agena 401) RM-15; 29-channel spectral and spatial IR experiment. RM-12: Spectral scanning (2.6 - 3 microns) interferometer. TV coverage of RM experiment field of view.	Orbit not achieved; destroyed 60 seconds after launch.
Program 461, RTS-I Satellite 1351	6/9/66	WTR	SLV-3 #7201, SS01B #AD-91; IR target detectors and radiometric detectors, threshold (specified) 50 kw/ster, maximum; secondary payloads: SECOR, AFRPL.	Agena PIV failure caused loss of second burn resulting in elliptical orbit and vehicle tumbling. Orbital parameters: Apogee altitude 1184 n.mi. Perigee altitude 101 n. mi. Eccentricity 0.210 Period 108.9 min. Inclination 90.05° On orbital turn-on of the satellite, the detection multiplexer, the nine-hour timer, and the status/failure telemetry link failed because of arcing of the star sensor power supply. The primary cause of the arc-over is believed to have been the gaseous environment resulting from the PIV failure.

TABLE 6.0.1-1 - Summary of Previous Flight Tests (Continued)

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Launch	Date	Launch Site	Configuration	Results
Program 461, Satellite 1351 (Cont.)				FTV 1351 was destroyed during reentry over Australia on 3 December 1966, on Rev 2300, after 178 days.
XI Program 461, Satellite 1352	8/19/66	WTR	SLV-3 #7202, SS01B #AD-103; IR target detectors and radiometric detectors, threshold (specified) 50 kw/ster, maximum; secondary payloads: SECOR, AFRPL, Vela, AFAPL. Orbital Parameters: Apogee altitude 2010 n.mi. Period 167.6 min. Perigee altitude 1993 n.mi. Inclination 90.12° Eccentricity 0.001	Launch, ascent, and injection were within nominal limits, except for the following anomalies: --Pneumatic leak in the second-stage booster. --Star sensor was noisy and inoperative in daylight, precluding satellite attitude determination to desired accuracy.
XII Program 461, Satellite 1353	10/5/66		SLV-3 7203, SS01B #AD-113: IR target detectors and radiometric detectors, threshold (specified) 50 kw/ster, maximum; secondary payloads; SECOR, AFRPL, VELA, AFAPL Orbital Parameters: Apogee altitude 2008 n.mi. Period 167.6 min. Perigee altitude 1996 n.mi. Inclination 90.18° Eccentricity 0.0004	Launch ascent, and injection were within nominal limits, except for the following anomalies: -- Star sensor lower in sensitivity than optimum design. Star sensors noisy but improved over satellite 1352. Some daylight attitude obtainable.

See Tables 6.9.1-2&3 For Summary of Target Sightings by FTV 1352 & 1353

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